

## Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



g 84M

**UNITED STATES DEPARTMENT OF AGRICULTURE**  
**MISCELLANEOUS PUBLICATION No. 78**

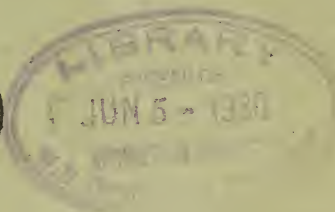
WASHINGTON, D. C.

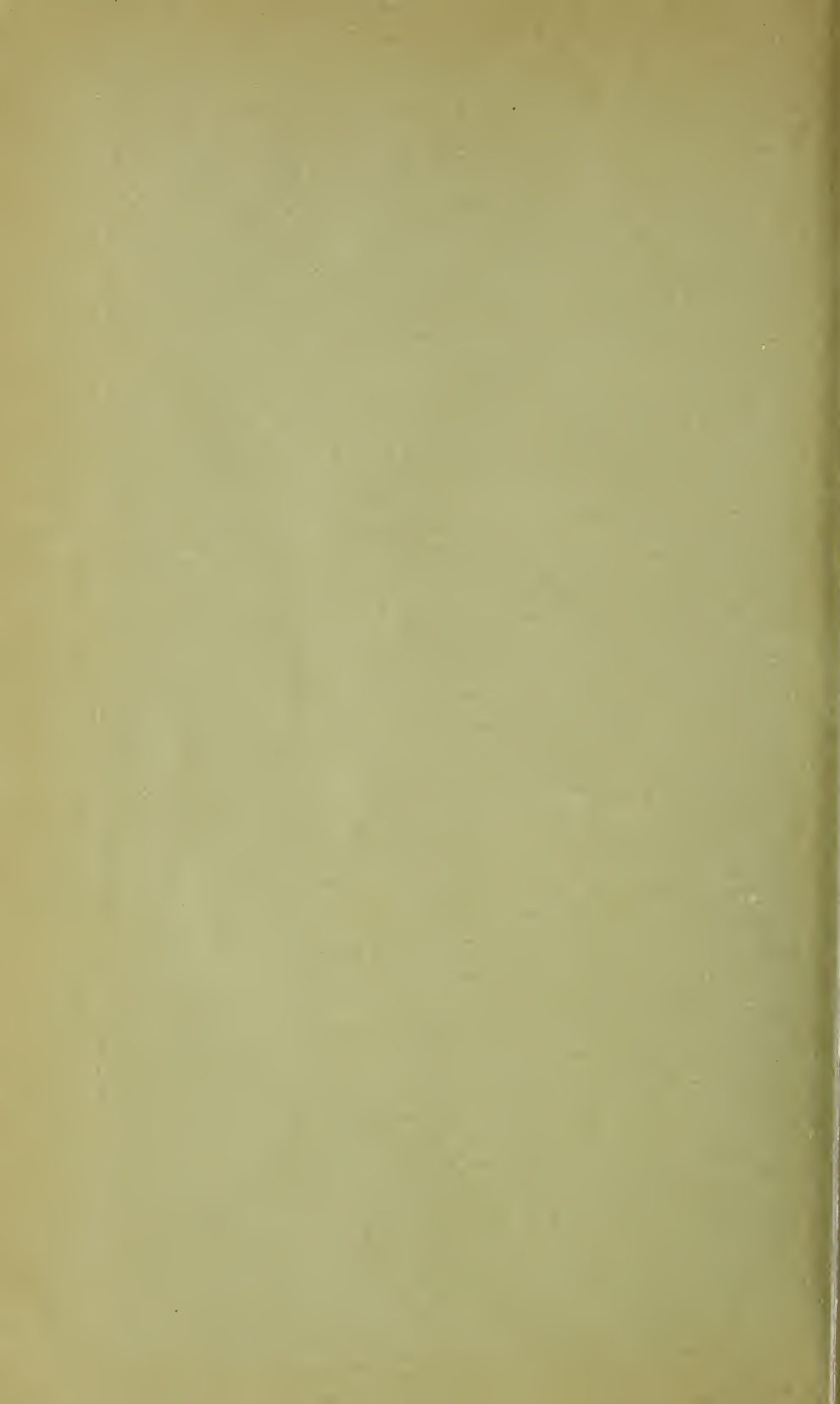
MAY, 1930

**AN ANNOTATED LIST  
OF LITERATURE REFERENCES  
ON GARMENT SIZES  
AND BODY MEASUREMENTS**

By

**RUTH O'BRIEN**  
Senior Textile Chemist in Charge  
Division of Textiles and Clothing  
Bureau of Home Economics





# UNITED STATES DEPARTMENT OF AGRICULTURE

MISCELLANEOUS PUBLICATION No. 78

WASHINGTON, D. C.

MAY, 1930

## AN ANNOTATED LIST OF LITERATURE REFERENCES ON GARMENT SIZES AND BODY MEASUREMENTS

By RUTH O'BRIEN, *Senior Textile Chemist, in Charge, Division of Textiles and Clothing, Bureau of Home Economics*

### CONTENTS

	Page		Page
Introduction.....	1	Measurements of adults.....	29
Systems of body proportions developed by artists.....	4	Army and Navy anthropometry.....	29
Measurements now used in the clothing trade.....	6	Records compiled by insurance companies.....	33
Anthropometry: Its scope, methods, and instruments.....	11	Measurements of college students.....	34
Measurements of children.....	19	Miscellaneous.....	40
		Need of a scientific basis for garment and pattern sizes.....	43
		Author index.....	47

### INTRODUCTION

The marked growth of the ready-to-wear clothing industry in the United States during the past few years has brought with it many difficulties in the proper sizing of garments, especially those manufactured for women and children. Such difficulties have always existed in pattern sizes, but these have not been so apparent to the commercial world. The woman who does her own sewing is not likely to stop buying patterns just because she has trouble with their proportions; therefore her complaints have not commanded much attention. However, from articles in the press and reports from those working with women interested in home sewing it is evident that the situation is just as unsatisfactory in connection with patterns as with ready-to-wear garments. A survey (p. 45) published in 1927 by this bureau showed that, of the 1,368 women questioned, 31 per cent had trouble in fitting the garments they made, and a larger proportion reported difficulty with this than with any other item of home sewing.

It is impossible to estimate just how much influence this dissatisfaction with patterns has had on the tendency to purchase clothing ready-made, but it is evident that the trend toward factory-made garments has brought the sizing situation into greater prominence and focused the attention of more groups upon it. Women are complaining because of the time and money they must spend in having clothes refitted at the stores, and retailers are disturbed at the expense involved in the maintenance of large alteration departments and the loss of good-will and money in returned goods and controversies over unsatisfactorily fitted garments.

The noticeable sales resistance to the dress styles introduced recently has undoubtedly been increased by the difficulties involved in proper fitting. Women often refuse to buy certain models because they do not fit and do not adapt themselves to alteration. The chance of obtaining an unsatisfactory result is too great, and the purchaser will not take the risk. It is also obvious that the waste involved in the practice of making and then later remaking so many garments is tremendous.

Some of the difficulty is due to the practice of "skimp-cutting" garments in order to undersell competitors. Some is due to the lack of uniformity in the sets of measurements used by different manufacturers for the same specified size or age. (Allison, p. 44.) The greatest trouble of all, however, lies in the fact that, with the exception of one study made by the United States War Department (Ireland, Davenport, and Love, p. 31) in an effort to establish proper sizes for uniforms, no scientifically determined measurements have ever been published which could be used for clothing construction.

The measurements now in use are apparently the result of traditional practices somewhat modified in accordance with complaints received by manufacturers and influenced more or less by data of doubtful value that have come from various sources. Although some clothing firms may have conducted investigations from time to time and perhaps are holding the results as trade secrets, it is unlikely that any considerable number of these were made by trained anthropometrists and the results properly analyzed by statisticians. In fact there are many indications that ancient ideas of proportions are still being relied upon.

The first interest in body measurements arose among the early painters and sculptors. Their efforts were directed almost entirely toward the development of imagined systems of proportions called canons. Many of these canons are recorded in literature. In most of them some part of the body, such as the foot, hand, head, or vertical column, is taken as the unit, and an attempt made to force a relation between this and the rest of the body. One of the earliest canons published is a Sanscrit treatise entitled "Silpi Sastri," which has been traced to the remote civilization of India. The author divided the human figure into 480 parts, the head being about one-seventh of the whole form. A very famous canon was developed by the celebrated sculptor, Polykletus, who lived about 400 B. C. He wrote a paper on human proportions and made a statue called Doryphoros, or Spearbearer, according to his system. Although neither his manuscript nor the statue has survived, his work has been mentioned by many of the Greek writers and his system, known as The Canon, has apparently greatly influenced other theorists. Alberti used one-sixth of the entire height for his modulus; whereas in some of his work Albrecht Dürer took the entire height as his unit.

Many other early writers developed elaborate and complicated geometric schemes by which they undertook to deduce all proportions of the body from one measurement. Many of these ideas were bound up with notions concerning the occult relation of certain numbers in connection with body measurements. One writer asserted that all of the proportions of the human figure are to be obtained from the number 7 (Liharžik, p. 5); another tried to find a harmony of numbers similar to musical harmonies. In all of these efforts no

serious attempts were made to obtain actual measurements, and they might be disregarded except for the fact that in many of the "systems of proportions" still put forth by garment designers some of the old ideas concerning the relative proportion of different parts of the body are advanced.

In more recent years, investigators in different sciences have measured the body for various purposes. Unfortunately, with few exceptions these studies have been made by people untrained in anthropometry or statistics, and the enormous volume of figures recorded is practically useless. From the standpoint of the clothing industry it is particularly distressing that not even the anthropometrists who have done reliable and noteworthy work in this line have reported data of value for clothing construction. The body landmarks used by them are entirely different from those used in garment construction, and practically no item can be used directly by a garment designer.

One source of measurements, which undoubtedly has influenced garment sizes, is military records. Some authorities state that the height and chest measurements taken during the Civil War were probably the first to serve as a basis for the manufacture of uniforms and civilian clothing. (Nystrom, p. 45.) Many of these measurements were accurately taken by medical officers, but others were obtained from local recruiting offices and were undoubtedly very hurriedly and inaccurately made. In most cases only the height, weight, and chest measures were recorded, but in some instances dimensions of the head, waist, and sitting height were included. (See references under Army and Navy Anthropometry, p. 29.) Again during the World War measurements were accumulated. However, it remained for Ireland, Love, and Davenport (p. 31) to make the first study with uniforms actually in mind. During demobilization after the World War they directed the measurements of 100,000 men, taking those measurements necessary for uniforms. This was done according to scientific methods and is the only published report of a study of this kind made with clothing construction definitely in view.

The great mass of physical measurements reported in the literature has come from scientists interested in the growth of children and from physical directors of gymnasiums who want data on physical development. The majority of the studies of the former type have included only height and weight determinations, although some have been more extensive. The studies made in gymnasiums have been more detailed. At one period there was intense interest in this part of the work, especially among the physical directors of colleges, universities, and Young Men's Christian Associations. Many of these groups agreed upon uniform procedures and instruments (Gulick, p. 15), and many tables of detailed measurements were published. However, here again the body landmarks used are not those needed in clothing construction, and the results are of little value to the clothing trade. The great importance of taking all body measurements according to the best anthropometrical methods can not be too strongly urged. If the examiner has not been trained in locating body landmarks and taking measurements, and if the instruments used are not accurate and suitable, the results are worthless.

Anthropometry is a science. The name was coined by the great Belgian artist and scientist, Quetelet (p. 42), who first realized the need of studying the body as it actually is and not determining its

measurements according to theories as to what it should be. The methods and instruments of the science have been very carefully worked out, and it would be necessary only to decide upon different body landmarks to make them applicable to the studies needed to establish measurements for clothing construction.

The following annotated list of references to publications in English has been prepared in an effort to cull from the literature all the material of any possible value to garment and pattern manufacturers who are concerned with the problem of sizing garments for American children and adults. References containing measurements of people other than Americans have, therefore, been excluded. If the chief result of this compilation is to show the dearth of authentic information on the subject and to point out the need for scientifically executed anthropometric studies, carefully planned for this particular purpose, a service will be rendered not only to manufacturers but more especially to distributors and users of ready-made garments and patterns in this country.

Abbreviations of titles of periodicals are those employed in the Experiment Station Record and are listed in the United States Department of Agriculture Department Bulletin 1330.

#### SYSTEMS OF BODY PROPORTIONS DEVELOPED BY ARTISTS

Early conceptions of artists as to what constitutes a perfectly formed body have unduly influenced ideas on body proportions. None of these were based on actual measurements of typical groups of people and were therefore largely imaginary. However, a study of such publications as those listed shows clearly that many of the modern so-called systems of proportions are a direct outcome of these ancient ideas.

##### ANONYMOUS.

1903. A WELL-PROPORTIONED ANATOMICAL MODEL. *Ann. Surg.* 38: 120.

Describes the proportions of a young man, claimed by Dr. G. McClellan to be, from an artistic point of view, one of the most perfectly formed men he had ever seen.

##### FLETCHER, R.

1883. HUMAN PROPORTION IN ART AND ANTHROPOMETRY . . . 37 p., illus. Cambridge, Mass., Moses King.

Summarizes the canons and systems of proportions devised by various artists in early times and emphasizes the possible contribution of anthropometry to art.

##### HARTLEY, J. S.

1891. ANATOMY IN ART. A PRACTICAL TEXT BOOK FOR THE ART STUDENT IN THE STUDY OF THE HUMAN FORM . . . 113 p., illus. New York, Styles & Cash.

One chapter entitled "Certain Laws Governing Proportion" discusses the Greek standard of proportion.

##### HAY, D. R.

1846. FIRST PRINCIPLES OF SYMMETRICAL BEAUTY. 88 p., illus. Edinburgh and London, William Blackwood & Sons.

Discusses the proportions of the human body and attempts to show their relation to musical harmonies.

---

1849. ON THE SCIENCE OF THOSE PROPORTIONS BY WHICH THE HUMAN HEAD AND COUNTENANCE AS REPRESENTED IN WORKS OF ANCIENT GREEK ART ARE DISTINGUISHED FROM THOSE OF ORDINARY NATURE. 80 p., illus. Edinburgh and London, William Blackwood & Sons.

The author discusses his theory that there is a numerical harmony at the basis of all types of harmony and shows how, by an application of



the principles of numerical harmony in accordance with a system of descriptive geometry, artistic representations of the human head and countenance may be produced.

HAY, D. R.

1851. THE GEOMETRIC BEAUTY OF THE HUMAN FIGURE DEFINED TO WHICH IS PREFIXED A SYSTEM OF ÆSTHETIC PROPORTION APPLICABLE TO ARCHITECTURE AND THE OTHER FORMATIVE ARTS. 68 p., illus. Edinburgh and London, William Blackwood & Sons.

Describes a numerical harmonic ratio and points out the method by which it may be applied to forms. A geometric system of determining artistic proportions of the human body is developed.

HOGARTH, W.

1909. THE ANALYSIS OF BEAUTY. [Edited by W. C. Ostrander]. 242 p., illus. Pittsfield, Mass., The Silver Lotus Shop.

In the chapter on proportion the author points out some of the absurdities of the mathematical concepts of beauty in human proportions as advocated by earlier writers.

LIHARŽIK, F. P.

1862. THE LAW OF INCREASE AND THE STRUCTURE OF MAN. 12 p., illus. Vienna, Imperial Royal Court and State Printing-Office.

Discusses the physiological significance of certain numbers in connection with the development of the body and describes a method of determining the proportions of the body by a geometrical system.

MANCHESTER, H. H.

1926. ANCIENT SYSTEMS OF HUMAN PROPORTIONS. *Clothing Trad Jour.* 26: 220-222, 237, illus.

Discusses the body proportions used by painters and sculptors in ancient Egypt and Greece.

---

1926. EARLY MODERN SYSTEMS OF HUMAN PROPORTIONS. *Clothing Trade Jour.* 26: 268-270, illus.

Discusses the investigations of the proportions of the normal body made by Leonardo da Vinci, Michelangelo, and Albrecht Dürer. Quotes the measurements that these painters considered correct for the human body and used in their paintings.

MARSHALL, J.

1879. A RULE OF PROPORTION FOR THE HUMAN FIGURE. 6 p., illus. London, Smith, Elder & Co.

Describes and illustrates a rule of proportion on the basis of units, each of which is one sixty-seventh of the standing height. Nine of these units is equivalent to a "head."

MOORE, T. S.

1904. THE IDEA OF A CANON OF PROPORTION FOR THE HUMAN FIGURE. *Burlington Mag. for Connoisseurs* [London] 5: 475-481.

Discusses the place of a canon of human proportions in creative art.

---

1905. ALBERT DÜRER. 343 p., illus. London, Duckworth & Co.; New York, Charles Scribner's Sons.

A discussion of the life and work of Albrecht Dürer, including a chapter on his ideas on proportion.

SARGENT, D. A.

1890. THE PHYSICAL TEST OF A MAN. *Amer. Assoc. Adv. Phys. Ed. Ann. Proc.* 5: 36-52.

Points out the absurdity of some of the earlier ideas of body proportions and some fallacies in the tables of standard measurements that had been advocated. Emphasizes the importance of using mean rather than average values.

SCHADOW, G.

1883. THE SCULPTOR AND ART STUDENT'S GUIDE TO THE PROPORTIONS OF THE HUMAN FORM WITH MEASUREMENTS IN FEET AND INCHES OF FULL-GROWN FIGURES OF BOTH SEXES AND OF VARIOUS AGES . . . Translated from the German by James J. Wright. 29 p., illus. London, Chapman & Hall, Ltd.

Outlines the history of the science of proportion as developed by eminent artists. Includes 30 plates showing human figures drawn according to the author's conception of correct proportions.

STORY, W. W.

1866. THE PROPORTIONS OF THE HUMAN FIGURE, ACCORDING TO A NEW CANON, FOR PRACTICAL USE; WITH A CRITICAL NOTICE OF THE CANON OF POLYCLETUS, AND OF THE PRINCIPAL ANCIENT AND MODERN SYSTEMS. 63 p., illus. London, Chapman & Hall.

Discusses the ancient cabala of number and symbols, the canon of Polycleetus as reported by Vitruvius, and the principal systems of proportions that have been developed, and proposes a new system of proportions of the human figure "by which the measures of all its parts may be exactly ascertained and determined without reference to the figure itself."

#### MEASUREMENTS NOW USED IN THE CLOTHING TRADE

The publications on measurements used in the clothing trade are apparently limited to discussions of proportions and systems of drafting devised by various workers. The proportions recommended seem to be based entirely on traditional ideas and not on actual measurements of individuals. In the few cases in which such studies are mentioned, no details of procedure or data are reported. It is therefore impossible to evaluate the conclusions drawn. All references giving only methods of drafting garments are omitted in the following compilation.

ANONYMOUS.

1912. GRADING TO-DAY. *Clothing Designer* 1 (4): 6-7, illus. [Reprinted in *Clothing Designer and Manfr.* 2 (5): 22-23, illus. 1914.]

Discusses systems of grading to change sizes of patterns. A scale of proportions said to be adopted from "results" of 10,000 individuals measured by a large concern is included.

1912. SCALE FOR JUVENILES. *Clothing Designer* 1 (5): 17.

Gives a scale of proportions for children's suits, blouses, and overcoats. The source of the information is not stated.

1914. GENERAL RULES OF HUMAN GROWTH. *Clothing Designer and Manfr.* 2 (11): 25, 29.

Gives a table entitled "The International Cutting Proportion Table of Average Measurements for Wholesale or Mail-order Trade," which includes measurements for children's, boys', and men's garments. The source of these data is not stated.

1914. VINCENT'S SCALE OF RELATIVE PROPORTIONS FOR MALES. *Clothing Designer and Manfr.* 2 (4): 25.

A table giving measurements to be used in making men's garments.

1915. STANDARDIZING MEASUREMENTS. *Clothing Designer and Manfr.* 3 (9): 26, 40.

A report of a committee of the National Association of Garment Manufacturers under the chairmanship of I. Cohen. The measurements of trousers and overalls were requested of many manufacturers and compiled into a set recommended for acceptance as standards. No measurements are given in the report.

1915. DIRECT MEASUREMENTS. *Clothing Designer and Manfr.* 3 (12): 34.

A criticism of the direct method of measuring as compared with the proportional system in designing and cutting men's garments.

1915. IS THERE A SCIENCE OF HUMAN MEASUREMENTS? *Clothing Designer and Manfr.* 4 (3): 13-14, 35-36.

Reprints a portion of a lecture entitled "Cutting by Fact or Fancy, Which Is Best?" published in *Minister's Gazette of Fashion* by W. E. Leggatt who does not believe in using systems of proportions in garment cutting but advocates direct measure cutting. His views are criticized by the writer.

## ANONYMOUS.

1919. ANALYZING THE STANDARD MEASUREMENTS AS ADOPTED BY GROUP "A" ATHLETIC UNDERWEAR AND NIGHTWEAR MANUFACTURERS. *Clothing Trade Jour.* 16: 85, 87, illus.

Discusses approvingly the standard sizes for underwear adopted by the athletic underwear and nightwear manufacturers.

1919. INSTRUCTION BOOK WITH DIAGRAMS FOR S. T. TAYLOR'S SYSTEM OF CUTTING LADIES' GARMENTS. 41 p., illus. New York, S. T. Taylor Co. Gives methods of drafting patterns for women's garments.

1929. NEW STANDARD OF PROPORTIONS ADVANCED. *Clothing Trade Jour.* 32: 298.

Reports the lists of proportions accepted as standard for dress patterns by a group of pattern manufacturers. The author states that these may not coincide with the average of anthropometric measurements from various sources but are the results of a compromise between such measurements, experience of pattern manufacturers, and commercial practice.

## BERNARD, M.

1917. DRAFTING. A STUDY OF PROPORTIONS. *Manfr. Clothier* 4 (1): 38, 39; (2): 34, 35.

Includes two tables of measurements of short men, short men grown stout, regular men, regular men grown stout, tall men, and tall men grown stout. Five measurements are given in each of these classes.

1917. PROPORTIONS FROM HEIGHT, WEIGHT AND CHEST CIRCUMFERENCE. *Manfr. Clothier* 4 (4): 40, 42-43.

Includes a table of weights for all heights and chest circumferences.

1917. PROPORTIONS. LEG LENGTHS FROM HEIGHTS AND HIP SIZES. *Manfr. Clothier* 4 (5): 44, 45.

Includes a table of leg lengths for all heights and hip sizes

1917. PROPORTIONS. WAIST RISES (OR FORK DEPTH). *Manfr. Clothier* 4 (6): 42, 44-45.

Includes a table of waist rises or fork depth of trousers.

1917. PROPORTIONS. UNDER ARM SLEEVE LENGTHS BY HEIGHT AND CHEST CIRCUMFERENCE. *Manfr. Clothier* 4 (7): 44-45.

Includes a table giving underarm sleeve lengths for all heights and chest circumferences.

1917. PROPORTIONS. OUTSIDE SLEEVES FOR ALL HEIGHTS AND CHEST SIZES. *Manfr. Clothier* 4 (8): 54, 57.

Includes a table of outside sleeve lengths for all heights and chests.

1917. PROPORTIONS. WAIST SIZES FOR ALL HEIGHTS AND CHESTS. *Manfr. Clothier* 4 (12): 50-51.

Includes a table of waist sizes for all heights and chests.

## CARLSTROM, J. A.

1905. CARLSTROM'S PROPORTIONS OF THE HUMAN FORM . . . 162 p. illus. New York, The Jno. J. Mitchell Co.

An arithmetical method of deducing body measurements from heights. Includes detailed discussion of measurements of men and boys and a short chapter on measurements of women.

## ERB, F. H.

1927. MEASURES OF MAN BY PROPORTIONS. *Clothing Trade Jour.* 29: 136-137.

Gives in detail the author's method of determining the measurements for men's clothing by proportion.

1927. PROPORTIONS AND SHORT MEASURES. *Clothing Trade Jour.* 30: 82-83, 94-95.

Short discussion of drafting for figures not of normal type. Includes a description of a method of drafting a dress-coat pattern for a short, stout, erect, square-shouldered type.

**ERB, F. H.**

1929. PROPORTIONS AS APPLIED TO DRAFTING. *Clothing Trade Jour.* 32: 263, 264-265, 349-351, illus.

Discusses proportions in connection with a description of methods of drafting patterns for men's coats.

1929. PROPORTIONS AS APPLIED IN PRACTICE. *Clothing Trade Jour.* 33: 29-30, 43, 97-98, 122, illus.

A continuation of article entitled "Proportions as Applied to Drafting." (See preceding reference.)

1929. PROPORTIONS AND MEASURES AS APPLIED TO DRAFTING. *Clothing Trade Jour.* 33: 163-164, illus.

Includes chiefly detailed instructions for drafting coat patterns for men of other than average proportions.

1929. PROPORTIONS AND MEASUREMENTS AS APPLIED TO DRAFTING. *Clothing Trade Jour.* 33: 216, 288-289 illus.

1929. PROPORTIONS AND SHORT MEASURES AS APPLIED TO DRAFTING. *Clothing Trade Jour.* 33: 337-338, illus.

Gives instructions for drafting a man's coat pattern

**HAPPLE-HUTCHESON, J.**

1903. DR. WAMPEN'S WORLD RENOWNED SYSTEM OF ANTHROPOMETRY. [79] p., illus. Chicago, J. Happle-Hutcheson.

Gives drafting methods for coats and vests developed by Henerich Wampen. Mentions some of the other systems and movements that have influenced garment cutters. Ed 2 includes the Happle-Hutcheson American trouser system.

**KEAN, A.**

1917. INDIVIDUAL MEASUREMENTS TO PROPORTIONATE DRAFTS. *Clothing Designer and Manfr.* 10: 162-163, illus.

Points out some of the defects in present practices of cutters and shows a draft for a coat.

1918. APPLYING DIRECT MEASUREMENTS TO A PROPORTIONATE DRAFT. *Clothing Trade Jour.* 13: 218-219, illus.

Describes a 42 stout draft for a coat.

**LAWS, E. A.**

1917. TABLE OF PROPORTIONS. *Manfr. Clothier* 4 (11): 26-27.

A table of proportions for use in the construction of men's and boys' garments.

**OLD HAND.**

1913. CUTTING BY BLOCK PATTERNS. *Clothing Designer and Manfr* 2 (1): 24-25.

Quotes tables from "Minister's Gazette of Fashion," May, 1913, and June, 1913, giving garment measurements for men, measuring 32, 34, 36, and 38 inches breast.

**PROUD, A. H.**

1906. THE AMERICANIZED FRENCH CUTTING METHOD. [64] p., illus. Chicago.

Gives detailed directions for drafting various types of coats, vests, and trousers. Tables of proportions for coats and trousers are included.

1915. VARIATIONS. *Clothing Designer and Manfr.* 3 (4): 32-34, illus.

Gives instructions for changing a draft in accord with body variations.

**[REGAL, S.]**

1924. THE AMERICAN GARMENT CUTTER. Ed. 4. 320 p., illus. New York, American Fashion Co.

Describes the drafting of men's and boys' clothing from body measurements. Includes tables of proportions for men and boys. The source of these figures is not given.

**ROSENFELD, I.**

1918. THE PRACTICAL DESIGNER . . . Rev. ed., 5 v. New York, The Leading Pattern Co.

Gives detailed directions for drafting patterns, describes a system of proportions, and gives tables of height and width proportions of garments for women, children, and infants.

RYAN, D. E.

1880. HUMAN PROPORTIONS IN GROWTH, BEING THE COMPLETE MEASUREMENT OF THE HUMAN BODY FOR EVERY AGE AND SIZE DURING THE YEARS OF JUVENILE GROWTH. [Ed. 2], 23 p., illus. New York, Griffith & Byrne.

A chart by means of which it is possible to determine various measurements for children's garments from one known body measurement. The author states "It originated from the complete measurement of over 2,600 children, boys and youths taken in different parts of the country, from Massachusetts to California, and of all classes of people who were measured by the author personally. Also, from the reports of managers of institutions containing large numbers of boys, and lastly from the proportions that from the base of average of the stocks of the leading manufacturing and retail houses of America." No methods of securing the measurements or definite data of an investigational nature are given. The height scale is based on the idea that the human form is divided into eight equal parts or sections and that by further dividing each of these into eighths, the various height landmarks of the body can be located.

1915. HUMAN PROPORTIONS. Clothing Designer and Manfr. 3 (6): 28, 39, illus.

Discusses the author's theory that pattern grading should be based on the division of the body into eight sections or "heads"

1915. THE HEIGHT MEASURE AND HUMAN PROPORTIONS. Clothing Designer and Manfr. 4 (1): 17-18, 34, illus.

Discusses the importance of considering height measure and proportions in grading patterns.

1915. THE AUTOBIOGRAPHY OF D. E. RYAN. Clothing Designer and Manfr. 3 (3): 24, 36, illus.; (4): 30, 37; (6): 16, 18-20; (7): 17, illus.; (8): 24.

The autobiography of one of the foremost contributors to the development of designs for ready-to-wear clothing. He is largely responsible for the system now used in drafting boys' and men's clothing. He was 75 years old when this autobiography was written.

1915. A LECTURE ON THE TAILOR DIVISIONAL SQUARE AND HUMAN PROPORTIONS IN GROWTH. Clothing Designer and Manfr. 3 (5): 26, 36; (6): 28, 39, illus.

Discusses the development of a system of cutting learned by the author's father 80 or 90 years earlier in the "House of Call," a meeting place for cutters in London, England. Also considers the importance of using height as the basis for drafting patterns.

1916. MEN'S HEIGHTS IN DRAFTING PATTERNS. Clothing Designer and Manfr. 9 (5 & 6): 32, 33, illus.

Emphasizes the importance of height in obtaining the proportionate depths of the body.

1918. HUMAN PROPORTIONS IN GROWTH. Clothing Trade Jour. 13: 219-220, illus.

Emphasizes the value of using the height measure to obtain the proper proportionate lengths of any person. The figure is taken as being eight heads tall, and the author bases his calculations on the division of the height into eighths.

1918. HUMAN PROPORTIONS IN GROWTH. HOW IT WAS INVENTED. Clothing Trade Jour. 14: 18, 28, 36.

Describes the work of the author which led to the production of his publication "Human Proportions in Growth." (See preceding reference.)

SIMONS, H.

1915. DRAFTING PANTS AND OVERALLS. 31 p., illus. New York, The Clothing Designer Co.

Includes a scale for drafting patterns of overalls reported by the standardization committee of the National Association of Garment Manufacturers. Also gives a scale of proportions for trousers.

SIMONS, H.

[1915]. THE SCIENCE OF GRADING PATTERNS FOR MEN'S, BOYS', AND CHILDREN'S CLOTHING. 71 p., illus. New York.  
Gives the author's system for grading clothing patterns.

[1922]. DESIGNING BOYS' AND JUVENILES' CLOTHING . . . 130 p., illus. New York, The Clothing Designer Co.  
Includes tables giving proportions for boys' coats and trousers. No information is included as to the source of the data.

[1924]. DRAFTING MEN'S AND BOYS' TROUSERS. 82 p., illus. New York, The Clothing Designer Co.  
Includes a discussion of proportions and anatomy of the legs

[1924]. THE SCIENCE OF GRADING PATTERNS FOR MEN'S AND YOUNG MEN'S CLOTHING. Ed. 2, 103 p., illus. New York, Clothing Designer Co. (Inc.).  
Directions are given for drafting men's clothing. A table of men's proportions from size 34 to 52 breast is included.

SIMONS, S.

1912. THE RIGHT PROPORTIONS. Clothing Designer 1 (2): 13-14, illus.  
Briefly considers the ancient ideas on body proportions

1912. HUMAN MEASUREMENTS. Clothing Designer 1 (3): 12-13; (4): 12, illus. [Last installment reprinted in The Clothing Designer and Manfr. 2 (4): 24, illus.]  
Quotes data relating to growth in weight and height

1918. APPLYING PROPORTION TO THE DESIGN. Clothing Trade Jour. 13: 220-221.

Demonstrates a coat draft of a normal 36 breast, height 68 inches, based on D. E. Ryan's human proportions. (See p. 9.)

SIMPSON, J. B. (INC.).

1929. CHARTS FOR CHECKING MEASURES BASED ON HEIGHT AND WEIGHT OF NORMAL, AVERAGE FIGURES. [32] p. [n. p.] J. B. Simpson (Inc.).

Charts prepared by the designing department of J. B. Simpson (Inc.) for the exclusive use of Simpson salesmen. Ten measurements for men's suits are given for six general types of figures of different heights and weights.

SMITH, R.

1915. CHILDREN'S PROPORTIONS. Clothing Designer and Manfr. 3 (11): 37.

Gives proportions for boys' garments size 14 and modifications of this for other sizes.

STONE, C. J.

[1891]. STONE'S PARAMOUNT CUTTER. A SYSTEM FOR CUTTING GARMENTS, BASED UPON SCIENTIFIC PRINCIPLES, INCLUDING THE SELF-VARYING SHOULDER IN CONNECTION WITH THE DIVISION OF THE BREAST MEASURE. Ed. 3 rev., 58 p., illus. Chicago, Chas. J. Stone Co. Cutting School.

Gives instructions for drafting patterns for men's garments.

[1897]. SUPERLATIVE SYSTEM OF CUTTING LADIES' GARMENTS . . . 93 p., illus. Chicago, Chas. J. Stone Co. Cutting School.

Gives instructions for drafting women's garments. Contains a table of average measurements. The source of the method of obtaining them is not given. A discussion of proportions is included.

[1900]. STONE'S NEW SUPERLATIVE COAT AND VEST SYSTEM BASED UPON THE PROPORTIONS OF THE HUMAN FORM. 121 p., illus. Chicago, Chas. J. Stone Co. Cutting School.

Describes a system of drafting coat and vest patterns based on the division of the height into 8 parts and the width into 16.

[1901]. NEW SUPERLATIVE SYSTEM OF CUTTING LADIES' GARMENTS . . . 109 p., illus. Chicago, Chas. J. Stone Co. Cutting School.

Directions are given for drafting patterns for women's garments. Contains a proportionate scale of average measurements for women's garments and a discussion of body proportions.

STONE, C. J.

- [1901]. STONE'S NEW SUPERLATIVE TROUSER SYSTEM . . . 57 p., illus. Chicago, Chas J. Stone Co. Cutting School.

Gives instructions for drafting trouser patterns. Includes a discussion of the proportions of the human form.

- [1910]. STONE'S ADVANCED SUPERLATIVE COAT AND VEST SYSTEM BASED UPON THE PROPORTIONS OF THE HUMAN FORM. 175 p., illus. Chicago. Chas. J. Stone Co.

A system of drafting coat and vest patterns based on the division of the height into 8 equal parts and the width into 16 equal parts.

- [1912]. STONE'S SCIENTIFIC SYSTEM OF GRADING PATTERNS FOR MEN'S GARMENTS BY THE PROPORTIONS OF HEIGHTS AND WIDTHS OF THE HUMAN FORM. 40 p., illus. Chicago, Chas. J. Stone Co.

Describes the author's system for increasing or decreasing the size of patterns for men's garments.

[SUTER, J.]

1889. IDEAL SYSTEMS OF GARMENT CUTTING. THE LAWS OF PROPORTION DEFINITELY APPLIED TO COATS, VESTS AND TROUSERS . . . [76] p., illus. New York, West Publishing Co.

Chiefly deals with drafting. Contains a few tables of proportions.

### ANTHROPOMETRY: ITS SCOPE, METHODS, AND INSTRUMENTS

The science underlying correct garment and pattern sizes is anthropometry, the science of human physical measurements. It is well developed, with standardized methods and instruments, but is so highly specialized that it is perhaps not so widely known and appreciated as many others. Any investigations made for the purpose of setting up suitable garment measurements should utilize the progress already made in this science. The following references are given in order to show the scope of anthropometry, to indicate the methods and instruments that should be used in studies of body measurements, and to emphasize the fact that they must be taken in a scientific manner by trained workers or the results are valueless.

ANONYMOUS

1924. A NEW MEASURING BOARD FOR BABIES. *Child Health Mag.* 5: 54, illus.

Describes a board designed by the United States Bureau of Standards and the United States Children's Bureau for measuring the length of babies.

BOAS, F.

1893. REMARKS ON THE THEORY OF ANTHROPOMETRY. *Amer. Statis. Assoc. Quart. Pubs.* (n. s. 24) 3: 569-575.

Discusses the methods used in the analysis of anthropometric data.

1922. REPORT ON AN ANTHROPOMETRIC INVESTIGATION OF THE POPULATION OF THE UNITED STATES. *Jour. Amer. Statis. Assoc.* 18: 181-209.

General discussion of heredity, environment, selection, racial, and individual differences, and eugenics as they affect bodily measurements. Outlines the studies which should be undertaken to investigate the population of the United States.

BOYD, E., and SCAMMON, R. E.

1927. A NEW METHOD OF ESTIMATING THE SURFACE AREA OF THE LIVING SUBJECT APPLIED TO CHILDREN. (Abstract) *Anat. Rec.* 35: 5.

Describes a method of determining the surface area of living children by making a plaster-of-Paris cast of the body.

BRADFIELD, H. S.

1927. THE DETERMINATION OF THE SURFACE AREA OF WOMEN AND ITS USE IN EXPRESSING BASAL METABOLIC RATE. *Amer. Jour. Physiol.* 82: 570-576, illus.

Compares the results obtained by measuring the surface area of women with a surface integrator and calculating it by the Du Bois linear formula, the Wörner linear formula, and the Du Bois height-weight formula.

BRINTON, D. G.

1869. EXTERNAL MENSURATION OF THE HUMAN SUBJECT. Med. and Surg. Rptr. 20: 1-3.

Suggests a list of body measurements and methods of taking them. Urges that all interested in such measurements should agree upon a uniform procedure in order that the results may be comparable.

BROWNE, C. R.

1891-93. SOME NEW ANTHROPOMETRICAL INSTRUMENTS. Roy. Irish Acad. Proc. (3) 2: 397-399, illus.

Describes an instrument for taking radial measurements of the head and a modification of Galton's instrument for measuring keenness of eyesight.

CAMBRIDGE SCIENTIFIC INSTRUMENT COMPANY.

1887. A DESCRIPTIVE LIST OF ANTHROMETRIC APPARATUS, CONSISTING OF INSTRUMENTS FOR MEASURING AND TESTING THE CHIEF PHYSICAL CHARACTERISTICS OF THE HUMAN BODY. . . 11 p. Cambridge, England. C. J. Clay, M. A., & Sons, University Press.

Describes the apparatus recommended at that date for making anthropometric studies.

CHAPIN, H. D. (See p. 21.)

CLELAND, J., Chairman

1904. ANTHROPOMETRIC INVESTIGATION IN GREAT BRITAIN AND IRELAND I. . . Brit. Assoc. Adv. Sci. Rpt. (1903) 73: 389-401.

Reports answers to questionnaires sent to persons in the British Isles and a few other countries in regard to methods used in Great Britain and Ireland at that time in anthropometric investigations. Gives details of methods used by various workers.

CLOUGH, H. D.

1924. A PHOTOGRAPHIC METHOD FOR STUDYING THE GROWTH AND NUTRITION OF CHILDREN. Soc. Expt. Biol. and Med. Proc. 21: 422.

An abstract of a paper describing a method of determining the growth of children by photographing them under standardized conditions at 3-month intervals.

and MURLIN, J. R.

1928. PERMANENT RECORDS OF GROWTH AND NUTRITION OF CHILDREN. Amer. Jour. Diseases Children 36: [425]-433, illus.

Describes a method of utilizing photography in the body measurement of children.

CORDEIRO, F. J. B.

1887. A CONTRIBUTION TO ANTHROPOMETRY. N. Y. Med. Jour. 45: 484-487, illus.

Discusses the laws of growth. Quotes data from a number of other investigators.

CUNNINGHAM, D. J., Chairman.

1905. ANTHROPOMETRIC INVESTIGATION IN GREAT BRITAIN AND IRELAND . . . Brit. Assoc. Adv. Sci. Rpt. (1904) 74: 330-337.

Discusses a plan for an extensive anthropometric study of the children and adults of the British Isles. The number necessary to give a fair sample is considered.

1906. ANTHROPOMETRIC INVESTIGATION IN THE BRITISH ISLES. Brit. Assoc. Adv. Sci. Rpt. 1905: 198-206, illus.

Includes a standard list of anatomical dimensions with detailed instructions for taking each measurement.

1907. ANTHROPOMETRIC INVESTIGATION IN THE BRITISH ISLES. Brit. Assoc. Adv. Sci. Rpt. 1906: 349-369, illus.

Illustrations are given showing the points on the human body between which it is suggested that anthropometric measurements be taken.

1908. ANTHROPOMETRIC INVESTIGATION IN THE BRITISH ISLES. Brit. Assoc. Adv. Sci. Rpt. 1907: 354-368, illus.

Includes a consideration of the best methods of measuring the chest.

1909. ANTHROPOMETRIC INVESTIGATION IN THE BRITISH ISLES. Brit. Assoc. Adv. Sci. Rpt. 1908: 351-399, illus.

Sums up the previous work of the committee. Gives detailed instructions, illustrated by photographs, for taking measurements



DAVENPORT, C. B.

1917. INHERITANCE OF STATURE. Carnegie Inst. Wash., Eugenics Rec. Off. Bul. 18, p. 313-389, illus. (Reprint from Genetics 2: 313-389.)  
Reports the results of a study of the influence of heredity upon stature.

1920. HEIGHT-WEIGHT INDEX OF BUILD. Amer. Jour. Phys. Anthropol. 3: 467-475.

Criticizes the view of Bardeen (see p. 40) that the best height-weight index of build is the ratio of weight to the cube of the height. Suggests that for young adult males the best index of build is apparently obtained by dividing weight by the square of the stature. This conclusion is based on a study of the physical measurements of two million men. (See Ireland, Davenport, and Love, p. 31.)

1920. THE BEST INDEX OF BUILD. Amer. Statis. Assoc. Quart. Pubs. (n. s. 131) 17: 341-344.

Contends that the best index of build is the weight divided by the square of the height.

1925. BODY BUILD: ITS DEVELOPMENT AND INHERITANCE. Carnegie Inst. Wash., Eugenics Rec. Off. Bul. 24, 42 p., illus..

An abstract of Carnegie Institution (Washington) Publication 329. An expression of build of children is obtained by dividing the chest girth by the stature. The build of adults is calculated by dividing the weight by the square of the stature. The effect of sex, race, geographical location, and heredity on build is discussed.

1926. HUMAN-GROWTH CURVE. Jour. Gen. Physiol. 10: 205-216, illus.

An analysis of weight measurements of other investigators from which the writer concludes that the human-growth curve shows only two outstanding periods of accelerated growth, the circumnata and the adolescent.

1927. MEASUREMENT OF MEN. Amer. Jour. Phys. Anthropol. 10: 65-70.

General discussion of the development of anthropometry, its application in many fields, and the great desirability of expressing quantitatively the physical and mental qualities of human beings.

DOWNES, R. M.

1914. THE INTERRELATIONSHIP OF SOME TRUNK MEASUREMENTS AND THEIR RELATION TO STATURE. Jour. Anat. and Physiol. 48: [299]-314.

Reports some trunk diameters of children and adults of both sexes, and points out their relation to height. A total of 201 persons were measured.

DRAPER, G.

1924. HUMAN CONSTITUTION. A CONSIDERATION OF ITS RELATIONSHIP TO DISEASE. 345 p. illus. Philadelphia and London, W. B. Saunders Co.

Contains a detailed description of methods of taking measurements and the instruments used for this purpose. Gives physical measurements of persons suffering from different diseases

DREYER, G., and HANSON, G. F.

1920. THE ASSESSMENT OF PHYSICAL FITNESS BY CORRELATION OF VITAL CAPACITY AND CERTAIN MEASUREMENTS OF THE BODY. [116] p., illus. London, New York, [etc.], Cassell & Co. (Ltd.).

Tables showing the relationship which, in the opinion of the author, exists between weight, sitting height, circumference of the chest, and the vital capacity of the lungs.

DU BOIS, D., and DU BOIS, E. F.

1914. THE MEASUREMENT OF THE SURFACE AREA OF ADULTS. Soc. Expt. Biol. and Med. Proc. 12: 16-18.

Describes a method of determining the surface area of adults and compares the results with suggested formulae for calculating surface area.  
and Du Bois, E. F.

1915. CLINICAL CALORIMETRY. FIFTH PAPER. THE MEASUREMENT OF THE SURFACE AREA OF MAN. Arch. Int. Med. 15: [868]-881, illus.

Summarizes the different methods in use for determining the surface area of individuals. Describes in detail a method by which a mold of the surface is made by pasting paper over tight-fitting underwear. The area is determined by cutting the mold in pieces, printing a pattern on photographic paper, cutting out the pieces of the pattern, and weighing them.

Du Bois, D., and Du Bois, E. F.

1916. CLINICAL CALORIMETRY. TENTH PAPER. A FORMULA TO ESTIMATE THE APPROXIMATE SURFACE AREA IF HEIGHT AND WEIGHT BE KNOWN. *Arch. Int. Med.* 17: 863-871, illus.

A method of calculating the surface area from the so-called linear formula is given and a simpler height-weight formula devised to estimate the surface of subjects if only their height and weight are known. A chart has been plotted so that the approximate surface may be determined quickly.

— and Du Bois, E. F.

1916. A HEIGHT-WEIGHT FORMULA TO ESTIMATE THE SURFACE AREA OF MAN. *Soc. Expt. Biol. and Med. Proc.* 13: 77-78.

Using a method previously described (see preceding reference), the surface area of 10 individuals was measured.

DUCKWORTH, W. L. H.

1919. THE INTERNATIONAL AGREEMENT FOR THE UNIFICATION OF ANTHROPO-METRIC MEASUREMENTS TO BE MADE ON THE LIVING SUBJECT. *Amer. Jour. Phys. Anthropol.* 2: 61-67.

"Report of the commission appointed by the Fourteenth International Congress of Prehistoric Anthropology and Archæology at Geneva (1912) to supplement the work commenced by the 12th Congress in the session at Monaco (1906)." Gives detailed definitions of the measurements approved by the commission and the congress to be used by anthropologists. (See also Hrdlička, *Anthropometry* p. 16.)

DWIGHT, T.

1894. THE RANGE AND SIGNIFICANCE OF VARIATION IN THE HUMAN SKELETON. *Boston Med. and Surg. Jour.* 131: 73-76, 97-101.

Discusses the variations in the bones of males and females as to size and shape, based on dissections.

FAILLIE, R.

1925. MEASUREMENT OF THE BODY SURFACE IN MEN AND IN WOMEN. *Arch. Int. Med.* 35: [626]-631, illus.

Offers a graph which can be used for calculating the body surface when the weight, height, and girth are known.

FRASSETTO, F.

1919. A UNIFORM BLANK OF MEASUREMENTS TO BE USED IN RECRUITING. A PLEA FOR THE STANDARDIZATION OF ANTHROPOLOGICAL METHODS. *Amer. Anthropologist* (n. s.) 21: 175-181.

The value of standardized methods of taking body measurements and of expressing the results is emphasized, and the formation of a permanent international executive committee of anthropologists is urged so that the results of anthropological studies throughout the world may be comparable.

1926. RELATIONS BETWEEN STATURE AND CHEST-GIRTH FORMULA OF NORMALITY AND NORMAL VALUES. *Natl. Acad. Sci. Proc.* 12: [583]-587, illus.

A study of the relation which exists between stature and chest girth. By analyzing the measurements of 255,181 subjects, the author derives the law: In young Italians of 20-21 years, starting from stature of 154 centimeters and corresponding chest girth of 84.6 centimeters, chest girth increases in arithmetical progression at the rate of 0.24 centimeters for every centimeter increase of stature.

FULD, L. F.

1915. THE MEASUREMENT OF HEIGHT. *Amer. Phys. Ed. Rev.* 20: 80-84.

Description of methods of measuring the standing height, length of trunk, and sitting height.

GRAY, H.

1922. THE RELATION OF WEIGHT TO CHEST GIRTH, STATURE, AND STEM LENGTH. *Amer. Jour. Phys. Anthropol.* 5: 251-257, illus.

From the measurements of 80 subjects, the author concludes that the weight is correlated with other physical measurements in the following order: (1) Chest girth; (2) height; (3) stem length; (4) short stem length, or distance from seventh cervical vertebra to seat.

GRAY, H.

1922. AGAINST MEASURING THE CHEST GIRTH AT REST. *Jour. Amer. Med. Assoc.* 79: 349-350, illus.

Advocates measuring the chest at both full inspiration and complete expiration and using the average as the midway girth instead of measuring the chest at rest.

— and WALKER, A. M.

1921. LENGTH AND WEIGHT. *Amer. Jour. Phys. Anthropol.* 4: 231-238.

Analysis and criticism of methods proposed by a number of investigators for predicting the weight of an individual from his height.

GULICK, L.

1888. MANUAL FOR THOSE DESIRING TO USE THE ASSOCIATION GYMNASIUM RECORDS. 15 p., illus. New York, International Committee of Young Men's Christian Association.

Describes apparatus and methods for taking physical measurements in the gymnasiums of the Young Men's Christian Associations.

- 18<sup>CC</sup> MANUAL FOR PHYSICAL MEASUREMENTS IN CONNECTION WITH THE ASSOCIATION GYMNASIUM RECORDS. 48 p., illus. New York, International Committee of Young Men's Christian Association.

Detailed description of methods of taking body measurements. Prepared for use in the physical training departments of Young Men's Christian Associations.

- 1893-95. PHYSICAL MEASUREMENTS AND HOW THEY ARE STUDIED. *Phys. Ed.* 2: 140-142, 152-153, 186-191, illus. 1893; 3: 172-174, illus. 1895.

A popular presentation of the statistical methods involved in analyzing physical measurements. The average, mean, and percentile methods are considered. (See also Seaver, p. 18.)

HALL, W. S.

1901. THE EVALUATION OF ANTHROPOMETRIC DATA. *Jour. Amer. Med. Assoc.* 37: [1645]-1648, illus.

Discusses the statistical analysis of data obtained from anthropometric studies and advocates the determination of the median value rather than of the arithmetical average.

HARTWELL, E. M.

1893. A PRELIMINARY REPORT OF ANTHROPOMETRY IN THE UNITED STATES. *Amer. Statis. Assoc. Quart. Pubs.* (n. s. 24) 3: 554-568.

Includes a bibliography of anthropometrical studies made in the United States and discusses them briefly.

HASTINGS, W. W.

1902. A MANUAL FOR PHYSICAL MEASUREMENTS FOR USE IN NORMAL SCHOOLS, PUBLIC AND PREPARATORY SCHOOLS, BOYS' CLUBS, GIRLS' CLUBS AND YOUNG MEN'S CHRISTIAN ASSOCIATIONS WITH ANTHROPOMETRIC TABLES FOR EACH HEIGHT OF EACH AGE AND SEX FROM 5 TO 20 YEARS, AND VITALITY COEFFICIENTS. 112 p., illus. Springfield, Mass., Wm. W. Hastings.

Discusses necessary instruments and methods of taking and recording measurements. Includes tables of measurements of girls and boys 5 to 20 years of age.

Chairman.

1904. PHYSICAL EXAMINATION, Y. M. C. A. . . *Amer. Phys. Ed. Rev.* 9: 255-261.

Contains a minimum list of measurements recommended for use by the physical directors of the Young Men's Christian Association, when making examinations in connection with physical-training work.

1905. THE OUTGROWTH OF THE WORK OF THE COMMITTEE ON ANTHROPOMETRY, APPOINTED 1903. *Amer. Phys. Ed. Rev.* 10: 120-126.

Report of the achievements of a committee on anthropometry appointed by the American Physical Education Association. Mentions a plan to provide a national type for each age for boys 10 to 16 and for men 17 years and above.

HITCHCOCK, E.

1887. PHYSICAL MEASUREMENTS, FALLACIES AND ERRORS. *Amer. Assoc. Adv. Phys. Ed. Ann. Proc.* 3: 35-42.

Points out some of the difficulties in taking physical measurements accurately and properly interpreting the results.

— and SEELYE, H. H. (See p. 37.)

HOLGATE, T. H.

1881. AN INSTRUMENT FOR MEASURING THE LOWER EXTREMITIES CORRECTLY. Med. Rec. [New York] 20: 164-165, illus.

Describes in detail a folding steel bar, with two sliding cross pieces, designed for measuring the length of the lower extremities of a subject lying in a horizontal position.

HOLMES, W. H.

1918. ORGANIZATION OF THE COMMITTEE ON ANTHROPOLOGY OF THE NATIONAL RESEARCH COUNCIL AND ITS ACTIVITIES FOR THE YEAR 1917. Amer. Jour. Phys. Anthropol. 1: 77-90.

Includes recommendations as to the physical examination of recruits for the World War in order that the results may be of value to anthropometrists.

HOWLAND, J., AND DANA, R. T.

1913. A FORMULA FOR THE DETERMINATION OF THE SURFACE AREA OF INFANTS. Amer. Jour. Diseases Children 6: 33-37, illus.

A formula constructed from available data, whereby the surface area of an infant may be calculated from its weight.

HRDLIČKA, A.

1918. PHYSICAL ANTHROPOLOGY: ITS SCOPE AND AIMS; ITS HISTORY AND PRESENT STATUS IN AMERICA. Amer. Jour. Phys. Anthropol. 1: 3-23, 133-182, 267-304, 377-414.

An extensive historical review with bibliographies of publications of American investigators in physical anthropology. Describes the development of research in this field in universities and governmental and private agencies and reports the institutions at which such studies were being made in 1918.

---

1919. ANTHROPOMETRY. Amer. Jour. Phys. Anthropol. 2: 43-67, illus.

Defines anthropometry and discusses the object and scope of the science. Includes a translation of "The International Agreement For the Unification of Craniometric and Cephalometric Measurements. Report of the commission appointed by the XIII International Congress of Prehistoric Anthropology and Archeology at Monaco, 1906" as given by Dr. G. Papihlault, reporter of the commission. This was translated from Doctor Papihlault's report in *L'Anthropologie* 17: 559-572, 1906. Also includes an English translation by W. L. H. Duckworth of the official version of "The International Agreement for the Unification of Anthropometric Measurements to be Made on the Living Subject."

---

1919. ANTHROPOMETRY. B. INTRODUCTION TO ANTHROPOMETRY. Amer. Jour. Phys. Anthropol. 2: 175-194.

Discussion of the necessity of proper instruments, equipment, training, and experience if reliable anthropometric work is to be done.

---

1919. ANTHROPOMETRY. C. ANTHROPOMETRY ON THE LIVING. INSTRUMENTS. Amer. Jour. Phys. Anthropol. 2: 283-319, illus.

Describes the necessary instruments and discusses the selection of measurements, landmarks, and method in detail.

---

1919. ANTHROPOMETRY. D. SKELETAL PARTS: THE SKULL. Amer. Jour. Phys. Anthropol. 2: 401-428, illus.

Describes methods of measuring skulls.

---

1920. ANTHROPOMETRY. E. OSTEOLOGY. Amer. Jour. Phys. Anthropol. 3: 147-173, illus.

Describes methods of measuring skeletal parts other than the skull.

---

1920. ANTHROPOMETRY. 163 p., illus. Philadelphia, The Wistar Institute of Anatomy and Biology.

Discusses in detail the instruments and methods used in making anthropometrical studies.

JACKSON, W. A. JR.

1893. GRAPHIC METHODS IN ANTHROPOMETRY. Phys. Ed. 2: 89-94, illus.

Describes an instrument devised by the author by means of which an outline of any part of the human body may be drawn to scale directly from the body.

MacCurdy, G. G.

1912. INTERNATIONAL CONGRESS OF PREHISTORIC ANTHROPOLOGY AND ARCHEOLOGY, GENEVA. (INTERNATIONAL ANTHROPOMETRIC AGREEMENT). Amer. Anthropol. 14: 621-631.

Reports the international agreement for the unification of anthropometric measures on the living as adopted by the Fourteenth International Congress of Prehistoric Anthropology and Archeology held at the University of Geneva, September 9-14, 1912.

1912. INTERNATIONAL CONGRESS OF PREHISTORIC ANTHROPOLOGY AND ARCHEOLOGY. Science (n. s.) 36: 603-608.

Reports the international agreement for the unification of anthropometric measures on the living adopted by the Fourteenth International Congress of Prehistoric Anthropology and Archeology. Gives measurements to be taken and details of the technic involved.

MacCurdy, J. H.

1905. A BIBLIOGRAPHY OF PHYSICAL TRAINING. 369 p. Springfield, Mass., Physical Directors' Society of the Young Men's Christian Associations of North America.

Includes an extensive section on anthropometry

MacDonald, A.

1902. A PLAN FOR THE STUDY OF MAN. WITH REFERENCE TO BILLS TO ESTABLISH A LABORATORY FOR THE STUDY OF THE CRIMINAL, PAUPER, AND DEFECTIVE CLASSES, WITH A BIBLIOGRAPHY OF CHILD STUDY. U. S. Cong. 57th, 1st sess., Senate Doc. 400, 166 p., illus.

Deals chiefly with psychological measurements, but includes an extensive bibliography on child study in which references on physical measurements are cited. (See also *Man and Abnormal Man* . . . by the same author on p. 25.)

Meylan, G. L.

1903. REPORT ON THE PRESENT STATUS OF ANTHROPOMETRIC EXAMINATIONS IN THE YOUNG MEN'S CHRISTIAN ASSOCIATIONS. Amer. Phys. Ed. Rev. 8: 146-151.

Gives a brief résumé of the development of anthropometric examinations in the Young Men's Christian Associations, discusses their status at that period, and makes recommendations in regard to changes in procedure.

— and Root, H. F.

1925. A SIMPLIFIED AND TRUSTWORTHY MEANS OF MEASURING STATURE. Boston Med. and Surg. Jour. 192: 111-112, illus.

Describes simple apparatus for the determination of height.

NARRAGANSETT MACHINE COMPANY.

[n. d.]. CATALOG OF MEDICAL AND ANTHROPOMETRIC APPARATUS. 48 p., illus. Providence, R. I., Narragansett Machine Co.

Pyle, W. H.

1913. THE EXAMINATION OF SCHOOL CHILDREN . . . 70 p., illus. New York, Macmillan Co.

Includes directions for taking height, sitting height, and weight during the routine examination of school children.

Rawling, L. B.

1911. LANDMARKS AND SURFACE MARKINGS OF THE HUMAN BODY. Ed. 4, 96 p., illus. New York, Paul B. Hoeber.

Describes, names, and indicates by drawings the various landmarks and surface markings. Of interest to those taking anthropometric measurements.

Roberts, C.

1878. A MANUAL OF ANTHROPOMETRY OR GUIDE TO THE PHYSICAL EXAMINATION AND MEASUREMENT OF THE HUMAN BODY . . . 118 p., illus. London, J. & A. Churchill.

Describes methods and apparatus for anthropometric studies. Includes tables giving height, weight, and chest circumference of English and American children and adults measured by the author and other investigators.

ROWE, A. W.

1925. VITAL FUNCTION STUDIES. I. AN ANALYSIS OF THE DREYER STANDARDS OF VITAL CAPACITY. *Amer. Jour. Physiol.* 72: 436-445.

Establishes a relation between sitting heights and length from perineum to crown in a recumbent position. Reports measurements of the relation of weight to hip circumference and derives equations for the relationship.

SARGENT, D. A.

1886. AN ANTHROPOMETRIC CHART SHOWING THE RELATION OF THE INDIVIDUAL IN SIZE, STRENGTH, SYMMETRY, AND DEVELOPMENT TO THE NORMAL STANDARD. 4 p., illus. Cambridge, Mass.

A chart upon which 55 listed measurements may be recorded. Is arranged to show the relation of the individual measured to a normal standard.

1887. ANTHROPOMETRIC APPARATUS WITH DIRECTIONS FOR MEASURING AND TESTING THE PRINCIPAL PHYSICAL CHARACTERISTICS OF THE HUMAN BODY. 14 p., illus. Cambridge, Mass.

Describes instruments to be used and methods of making anthropometrical measurements and tests. Diagrams showing the body landmarks to be used are also given.

HITCHCOCK, E., and ANDERSON, W. G.

1887. REPORT OF THE COMMITTEE ON STATISTICS, APPOINTED BY THE ASSOCIATION IN 1885, GIVING THE DETAILED METHOD OF SECURING MEASUREMENTS, TESTS, AND THE CONDITION OF THE HUMAN BODY. *Amer. Assoc. Adv. Phys. Ed. Proc.* (1886) 2: 6-15.

Gives complete list of measurements and directions for taking them recommended to the American Association for the Advancement of Physical Education as important in physical examination.

SEEVER, J. W.

1909. ANTHROPOMETRY AND PHYSICAL EXAMINATION. A BOOK FOR PRACTICAL USE IN CONNECTION WITH GYMNASIUM WORK AND PHYSICAL EDUCATION. New ed., rev. and enl., 191 p., illus. New Haven, Conn. [The Curtiss-Way Co., Meriden, Conn.]

Describes the apparatus, charts, and methods used in anthropometric measurements. Reports extensive data on body measurements of college students, including those taken by M. Anna Wood, of Wellesley College students; by Delphine Hanna, of Oberlin College women; by Anna Barr Clapp, of University of Nebraska women; by J. W. Seaver of Yale University students; by L. Gulick, E. Hitchcock, and others. Some of this material was originally published by the authors in chart form in such limited editions that it is not easily accessible now except in this manual.

SKERRETT, R. G.

1919. TESTING PHYSICAL FITNESS WITH THE CAMERA. *Sci. Amer.* 120: 578, illus.

Describes a photographic method devised by T. W. Kilmer, a New York physician, for obtaining records of the body measurements and growth of children. Also discussed by the author in *Illus. World* 31: 709-711, illus.

STANLEY, W. F.

1886. A PORTABLE SCALE OF PROPORTIONS OF THE HUMAN BODY. *Brit. Assoc. Adv. Sci. Rpt.* (1885) 55: 1206.

Describes a small ivory rule, divided into a scale of proportions taken from measurements of the diagrams of the assumed perfect human forms given by John Marshall in his book *A Rule of Proportion for the Human Figure*. (See p. 5.) This rule can be used for the comparison of persons with this assumed perfect form.

SULLIVAN, L. R.

1923. ESSENTIALS OF ANTHROPOMETRY . . . 73 p., illus. New York, Amer. Mus. Nat. Hist.

A handbook giving detailed instructions for taking measurements of stature, head length, head width, face width, face height, nose height, and nose width. A record blank is suggested and needed instruments are described.

SWAIN, F.

1887. ANTHROPOMETRIC MEASUREMENTS. Amer. Assoc. Adv. Phys. Ed. Ann. Proc. 3: 43-50.

Describes apparatus and methods of taking body measurements recommended by the author.

TODD, T. W.

1925. THE RELIABILITY OF MEASUREMENTS BASED UPON SUBCUTANEOUS BONY POINTS. Amer. Jour. Phys. Anthropol. 8: 275-279.

A study of the errors made in body measurements as a result of instrumental method and the summation of smaller measurements in the computation of greater dimensions.

TOPINARD, P.

1881. OBSERVATIONS UPON THE METHODS AND PROCESSES OF ANTHROPOMETRY. Jour. Anthropol. Inst. Gt. Brit. and Ireland 10: 212-224.

General discussion of anthropometric principles and the difficulties involved in taking accurate body measurements. The author's methods are given.

WHIPPLE, G. M.

1910. MANUAL OF MENTAL AND PHYSICAL TESTS . . . 534 p., illus. Baltimore. Warwick & York.

Includes a chapter on anthropometric tests which contains a short bibliography on the subject. Data on standing and sitting heights, weights, and head measurements reported by other authors are quoted.

WILDER, H. H.

[1920]. A LABORATORY MANUAL OF ANTHROPOMETRY. 193 p., illus. Philadelphia, P. Blackiston's Sons & Co.

Contains a detailed description of the instruments and methods used by anthropometrists in measuring the body and the bones including the skull. Appendix B reports a complete anthropometric study of 100 Smith College students made by Margaret Washington.

### MEASUREMENTS OF CHILDREN

No studies giving the physical measurements of infants or children determined for the specific purpose of establishing correct garment and pattern sizes are reported in the literature. There are many growth studies made by outstanding anthropometrists, but most of these give data chiefly on height and weight. The following list includes the most important publications of this kind

ANONYMOUS.

1903. CHILD STUDY IN CHICAGO. U. S. Bur. Ed. Rpt. Commr. Ed. (1902) 1: 1095-1138.

Reports standing height, sitting height, and weight of Chicago school children. Reprints the reports of F. W. Smedley for 1899-1900, and 1900-1901.

AFFLECK, G. B.

1920. A MINIMUM SET OF TENTATIVE PHYSICAL STANDARDS FOR CHILDREN OF SCHOOL AGE. Pedag. Seminary 27: 324-353.

Summarizes the work of many investigators on the growth of children, including a consideration of height and weight. A bibliography of 149 references is appended.

ANDERSON, W. G. (See p. 35.)

BALDWIN, B. T.

1911. NOTES ON SCHOOL OBSERVATION. THE PHYSICAL NATURE OF THE CHILD. Texas Univ. Ext. Ser. Bul. 17, 26 p., illus.

Instructions for teachers making observations on the physical status of children. The growth in height and weight of 14 boys and 11 girls is recorded graphically.

1914. THE NORMAL CHILD: ITS PHYSICAL GROWTH AND MENTAL DEVELOPMENT. Pop. Sci. Mo. 85: 559-567, illus.

Reports, by means of curves the height and weight of boys and girls, based on 43,840 measurements on approximately 1,000 boys and 1,000 girls.

BALDWIN, B. T

1914. PHYSICAL GROWTH AND SCHOOL PROGRESS. U. S. Bur. Ed. Bul. 10, 215 p., illus.

Reports height, weight, and lung capacity of 861 boys and 1,063 girls from the University of Chicago elementary and high schools, the Frances W. Parker School of Chicago, and the Horace Mann School of Teachers College, Columbia University, New York City. The records were taken by trained anthropometrists on the same individuals at yearly and half yearly intervals over a period of from 3 to 12 years. A summary of the conclusions of many investigators in regard to growth is included as well as a bibliography of 336 references.

1916. A MEASURING SCALE FOR PHYSICAL GROWTH AND PHYSIOLOGICAL AGE. Natl. Soc. Study Ed. Yearbook 15 (Pt. 1): 11-22, illus.

Gives norms for physical growth in height, weight, and lung capacity of children from 5½ to 18 years of age based on the best developed children available who had had physical training, school medical inspection, directed play, and remedial treatment when necessary.

1921. THE PHYSICAL GROWTH OF CHILDREN FROM BIRTH TO MATURITY. Iowa Univ. Studies Child Welfare v. 1 (No. 1), 411 p., illus.

Includes a description of anthropometric instruments and methods of measuring and data on physical measurements obtained in studies on the growth of infants, preschool children, and school children. Height, weight, sitting height, and girth of chest are the measurements reported that are of chief interest to clothing manufacturers. A bibliography of 911 references is given.

1925. WEIGHT-HEIGHT-AGE STANDARDS IN METRIC UNITS FOR AMERICAN-BORN CHILDREN. Amer. Jour Phys. Anthropol. 8: 1-10.

Reports the original averages of the height, weight, and age of 74,000 boys and 55,000 girls weighed nude and measured in metric units. These data were used as the basis for the Baldwin-Wood tables.

1926. ANTHROPOMETRIC MEASUREMENTS. In Terman, L. M., ed. Genetic Studies of Genius. Ed. 2, v. 1, p. 134-171, illus.

In chapter VII, Anthropometric Measurements, by Bird T. Baldwin, are reported the results of an anthropometric study of 594 gifted children. Thirty-seven measurements were taken on each child. The results are compared with those obtained with other groups in various sections of the United States.

BEAN, R. B. (See p. 41.)

BENEDICT, F. G., and TALBOT, F. B.

1921. METABOLISM AND GROWTH FROM BIRTH TO PUBERTY. 213 p., illus. Washington, D. C. (Carnegie Inst. (Wash.) Pub. 302).

In the section "Anthropometric Measurements as Indices of Growth" the body weight, height, circumference at nipples, hips, and buttocks of boys and girls of various ages are reported

BOAS, F.

1895. THE GROWTH OF FIRST-BORN CHILDREN. Science (n. s.) 1: 402-404. Reports heights and weights of children in Toronto, Ontario, and in California analyzed on basis of sex and relative time of birth in the family.

1898. THE GROWTH OF TORONTO CHILDREN. U. S. Bur. Ed. Rpt. Commr. Ed. (1896/97) 2: 1541-1599.

The report includes data on height, sitting height, and weight of boys and girls in Toronto, Ont., and Oakland, Calif. A short summary is given in Brit. Assoc. Adv. Sci. Rpt. 67: 443-449.

1912. GROWTH. In Monroe, P., ed. Cyclopedia of Education 3: 187-190.

Includes measurements of stature, sitting height, weight, length of head, width of head, length of forearm, and width of hand of New England school children 6 to 17 years of age and a table of annual increments for various measurements of individuals 5 to 22 years of age.



BOAS, F., and CLARK, W.

1906. STATISTICS OF GROWTH. U. S. Bur. Ed. Rpt. Commr. Ed. (1893/94) 1: 25-132, illus.

Statistical study of data collected on the measurement of school children in Worcester, Mass., Toronto, Ont., and Milwaukee, Wis. Standing height, sitting height, length of head, breadth of head, and breath of face are some of the measurements included.

— and WISSLER, C.

1906. STATISTICS OF GROWTH. U. S. Bur. Ed. Rpt. Commr. (1903/4) 1: 25-132, illus.

A statistical analysis of school children's measurements collected in Worcester, Mass., Toronto, Ont., and Milwaukee, Wis., undertaken in an effort to determine some of the fundamental laws of growth.

BOWDITCH, H. P.

1877. THE GROWTH OF CHILDREN. Mass. Bd. Health Ann. Rpt. 8: 273-324, illus.

Study of the heights and weights of approximately 24,500 Boston school children, analyzed from the standpoint of occupational classes (laboring and nonlaboring), parentage, and sex. Also compares results with those of investigators in other countries.

1879. THE GROWTH OF CHILDREN (A SUPPLEMENTARY INVESTIGATION), WITH SUGGESTIONS IN REGARD TO METHODS OF RESEARCH. Mass. Bd. Health Ann. Rpt. 10: [33]-62, illus.

Compares the height and weight of Boston public-school children whose parents have different occupations. Includes suggestions as to data that should be collected in an anthropometric study and gives typical report blanks.

1890. THE GROWTH OF CHILDREN, STUDIED BY GALTON'S METHOD OF PERCENTILE GRADES. Mass. Bd. Health Ann. Rpt. 22: [477]-522, illus.

An application of Galton's method of analyzing statistical data by percentile grades to the results published in 1877 under the title "The Growth of Children" on heights and weights of Boston school children.

BURK, F.

1898. GROWTH OF CHILDREN IN HEIGHT AND WEIGHT. Amer. Jour. Psychol. 9: [253]-326, illus.

Reviews and discusses findings of other investigators on the height and weight of children. A bibliography of 109 references is included. Reviewed in Northwestern Mo. 8: 586-588.

CHAPIN, H. D.

1894. A PLAN OF INFANTILE MEASUREMENTS. Med. Rec. [New York] 46: 649-651, illus.

Describes methods of measuring infants, chiefly methods of measuring the skull. Gives skull measurements, facial length, chest circumference, abdomen circumference, and length and weight of body of 92 infants, from birth to 2 years.

CHRISTOPHER, W. S.

1900. MEASUREMENTS OF CHICAGO SCHOOL CHILDREN. Jour. Amer. Med. Assoc. 35: 618-623, 683-687, illus.

Reports the height, weight, sitting height, ergograph work, strength of grip of the right and left hands, hearing, and vital capacity of 5,636 children in the Chicago schools.

1900. REPORT OF W. S. CHRISTOPHER. Chicago Bd. Ed. Ann. Rpt. 45: 27-75, illus.

Reports measurements of Chicago school children, including height, weight, and sitting height.

CLARK, T., COLLINS, G. L., and TREADWAY, W. L.

1916. RURAL SCHOOL SANITATION INCLUDING PHYSICAL AND MENTAL STATUS OF SCHOOL CHILDREN IN PORTER COUNTY, INDIANA. U. S. Pub. Health Serv., Pub. Health Bul. 77, 127 p., illus.

Gives height and weight of 2,488 children.

CLARK, T., SYDENSTRICKER, E., and COLLINS, S. D.

1922. HEIGHTS AND WEIGHTS OF SCHOOL CHILDREN. Pub. Health Rpts. [U. S.] 37(20): 1185-1207, illus. [Also published as Pub. Health Rpts. [U. S.], Reprint 750, 36 p., illus. Washington, [D. C.]]

A study of the heights and weights of 14,335 native white school children in Maryland, Virginia, North Carolina, and South Carolina.

CLOUGH, H. D. (See p. 12.)

— and MURLIN, J. B. (See p. 12.)

COLLINS, S. D., and CLARK, T.

1929. PHYSICAL MEASUREMENTS OF BOYS AND GIRLS OF NATIVE WHITE RACE STOCK (THIRD GENERATION NATIVE BORN) IN THE UNITED STATES. (Phys. Measurement Studies no. 1.) Pub. Health Rpts. [U. S.] 44: 1059-1083, illus.

Reports physical measurements of 30,000 school children of native white parents and grandparents in the United States. Measurements were made of standing height, sitting height, chest circumference, transverse diameter, anteroposterior diameter, and vital capacity.

CRAMPTON, C. W.

1908. PHYSIOLOGICAL AGE—A FUNDAMENTAL PRINCIPLE. SECTION II. THE SIGNIFICANCE OF PHYSIOLOGICAL AGE IN TERMS OF STRUCTURE AND FUNCTION. Amer. Phys. Ed. Rev. 13: 214-227.

Contains tables giving weights and heights of high-school boys, classified according to the number of boys belonging to age, pubescence, weight, and height groups.

1908. PHYSIOLOGICAL AGE—A FUNDAMENTAL PRINCIPLE. SECTION III. Amer. Phys. Ed. Rev. 13: 268-283.

Data on height and weight of high-school children are given in connection with a study correlating these factors with scholarship and an investigation on rates of growth.

CRUM, F. S.

[n. d.]. ANTHROPOMETRIC TABLE. MALE AND FEMALE CHILDREN FROM SIX TO FORTY-EIGHT MONTHS OLD . . . [4] p. Newark, N. J., the Prudential Insurance Co. of America.

Reports average weight, height, circumference of head, chest and abdomen, diameter of chest, and length of arm and leg of 5,602 male and 4,821 female infants. These data were compiled by an officer of the Prudential Insurance Co. of America. No information concerning the source of the measurements or methods of taking them is given.

[n. d.]. ANTHROPOMETRIC TABLE FOR MALE AND FEMALE CHILDREN FROM SIX TO FORTY-TWO MONTHS OLD, BASED ON THE MEASUREMENTS OF THREE THOUSAND FOUR HUNDRED AND FORTY-EIGHT NORMAL BABIES IN TWENTY-THREE STATES. [4] p. Chicago, Amer. Med. Assoc.

Reports average weight, circumference of head, chest, and abdomen, diameter of chest, and length of arm and leg of 1,843 male and 1,605 female infants. These data were compiled by an officer of the Prudential Insurance Co. of America and published by the council on health and public instruction of the American Medical Association for the committee on public health education among women. No information concerning the source of the measurements or method of taking them is given.

1916. ANTHROPOMETRIC STATISTICS OF CHILDREN—AGES SIX TO FORTY-EIGHT MONTHS. Amer. Statis. Assoc. Quart. Pubs. (n. s. 115) 15: 332-336.

Includes table of average measurements of 5,602 male and 4,821 female infants. Weight, height, circumference of head, chest, and abdomen, lateral and anteroposterior diameter of chest, and length of arm and leg are given.

DAVENPORT, C. B. (See Body Build, p. 13.)

DAWSON, G. E.

1896. A STUDY OF YOUTHFUL DEGENERACY. Pedag. Seminary 4: [221]-258.

Reports measurements of weight, height, and chest girth of 60 children in reform schools in Massachusetts and compares the data with that reported for normal children.

DEBUSK, B. W.

1913. HEIGHT, WEIGHT, VITAL CAPACITY, AND RETARDATION. Pedag. Seminary 20: [89]-92.

Reports the height, weight, vital capacity, and grade distribution of 105 boys of the Colorado Teachers College Training School.

FABER, H. K.

1929. A WEIGHT RANGE TABLE FOR CHILDREN FROM 5 TO 15 YEARS OF AGE. *Amer. Jour. Diseases Children* 38: [758]-761.

Gives height-weight-age tables based on the measurement of over 60,000 school children of San Francisco, Calif.

FRANKEL, L. K., and DUBLIN, L. I.

1916. HEIGHTS AND WEIGHTS OF NEW YORK CITY CHILDREN 14 TO 16 YEARS OF AGE. 53 p., illus. New York, Metropolitan Life Insurance Co.

A statistical study of 10,043 children who had been granted employment certificates. The data are considered from the standpoint of age, school grade, and nationality.

FREEMAN, R. G.

[1914]. WEIGHTS AND MEASUREMENTS OF INFANTS AND CHILDREN IN PRIVATE PRACTICE COMPARED WITH INSTITUTION CHILDREN AND SCHOOL CHILDREN. *Amer. Ped. Soc. Trans.* 26: 203-210, illus. [Reprinted in *Amer. Jour. Diseases Children* 8: 321-326, illus.]

Reports, chiefly by charts, the heights and weights of well-cared-for children met in the private practice of the author. Compares these with data regarding children in orphanages and in public schools.

— and SEARFOSS, R.

1929. GROWTH OF PRIVATE DAY SCHOOL BOYS. *Arch. Ped.* 46: 450-455, illus.

Reports measurements of 200 boys 6 to 15 years of age attending a private day school in New York City. Total stature, weight, chest girth, trunk height, and leg length are recorded. All measurements were taken of nude boys.

GERSHEL, M. A.

1911. AN INVESTIGATION INTO THE GROWTH IN HEIGHT AND WEIGHT OF DEPENDENT CHILDREN. 39 p. New York, Russell Sage Foundation.

Reports height and weight of over 2,000 American dependent Jewish boys and girls.

GILBERT, J. A.

1894. RESEARCHES ON THE MENTAL AND PHYSICAL DEVELOPMENT OF SCHOOL CHILDREN. *Yale Psychological Lab. Studies* 2: 40-100, illus

Includes height and weight data on the children studied.

GODIN, P.

[1920]. GROWTH DURING SCHOOL AGE. ITS APPLICATION TO EDUCATION . . .

Translated by Samuel E. Eby. 268 p., illus. Boston, Richard G. Badger, The Gorham Press.

A study of growth by a French educator. No measurements are given, but some general observations bearing on changes in size at different ages are included.

GRAY, H.

1921. IDEAL TABLES FOR SIZE AND WEIGHT OF PRIVATE SCHOOL BOYS. PART II. *Amer. Jour. Diseases Children* 22: [272]-283.

Gives tables for judging the normality of the height, chest girth, and weight of private school boys.

1921. SIZE AND WEIGHT IN 130 BOARDING-SCHOOL BOYS (MIDDLESEX). *Med. Clinics North Amer.* 4: 1899-1914.

Reports weight, height, and chest circumference of 130 boys of various ages attending a boarding school in the United States.

1922. SITTING HEIGHT AND STEM LENGTH IN PRIVATE-SCHOOL BOYS. *Amer. Jour. Diseases Children* 23: [406]-418, illus.

Reports standing height, sitting height, and stem length of 114 school boys. Bibliography is included.

— and FRALEY, F.

1926. GROWTH STANDARDS. HEIGHT, CHEST GIRTH, AND WEIGHT FOR PRIVATE-SCHOOL BOYS. *Amer. Jour. Diseases Children* 32: [554]-555.

Gives tables of height, chest girth, and weight for age for boarding and country day-school boys based on measurements of 1,016 boys

— and GOWER, C.

1928. GROWTH STANDARDS OF HEIGHT AND WEIGHT FOR GIRLS IN PRIVATE SCHOOLS. *Amer. Jour. Diseases Children* 35: 411-413.

Reports heights and weights of 1,030 girls in private schools in or near Chicago, Ill.

— and GRAY, K. M. (See p. 41.)

GRAY, H., and JACOMB, W. J.

1921. SIZE AND WEIGHT IN ONE HUNDRED AND THIRTY-SIX BOARDING-SCHOOL BOYS (GROTON). *Amer. Jour. Diseases Children* 22: [259]-271, illus.

Reports height, weight, and chest girth of 136 boys at Groton School, Groton, Mass., and compares the data with those obtained by other investigators.

— and NICHOLSON, S. T.

1927. THE TALLEST AMERICAN BOYS. *Jour. Amer. Med. Assoc.* 88: 2022-2024, illus.

Reports mean height of 1,016 boarding-school boys and by comparing these with figures obtained by other investigators shows that data available at present indicate that this is the tallest group of American boys.

GREENWOOD, J. M.

1892. HEIGHTS AND WEIGHTS OF CHILDREN. *Amer. Pub. Health Assoc., Pub. Health Papers and Rpts.* (1891) 17: 199-204.

Reports heights and weights of boys and girls, white and colored, of the public schools of Kansas City, Mo., during the years 1886 and 1890. These data are compared with those obtained by other investigators both in America and in Europe.

GRIFFITH, J. P. C., and MITCHELL, A. G.

1927. THE DISEASES OF INFANTS AND CHILDREN Ed. 2. 2 v. Philadelphia and London, W. B. Saunders Co.

Includes data obtained by the authors and other investigators on height, weight, chest circumference, and head circumference

GROVER, J. I.

1915. SOME MEASUREMENTS OF NORMAL CHILDREN, ESPECIALLY OF THE LEG AND ARM. SOME INTERESTING DEDUCTIONS AND PRACTICABLE POSSIBILITIES. *Arch. Ped.* 32: [473]-486, illus.

Reports measurements of 500 normal children of both sexes from birth to 12 years of age. The total length, length of leg, length of arm, and head and chest circumference are some of the measurements taken

HALL, W. S.

1896. THE CHANGES IN THE PROPORTIONS OF THE HUMAN BODY DURING THE PERIOD OF GROWTH. *Jour. Anthropol Inst. Gt. Brit and Ireland* 25: 21-46, illus.

Reports a study of 2,000 boys attending private schools in or near Philadelphia, Pa. A total of 31 measurements were taken on each boy.

HASTINGS, W. W.

1900. ANTHROPOMETRIC STUDIES IN NEBRASKA *Amer Phys. Ed Rev.* 5: 53-66.

Discusses a study of the physical characteristics of 2,500 school children of Nebraska. For data see *A Manual for Physical Measurements for Use in Normal Schools* . . . by the same author, p. 15

HERSKOVITS, M. J.

1924. SOME OBSERVATIONS ON THE GROWTH OF COLORED BOYS. *Amer. Jour. Phys. Anthropol.* 7: 439-446.

Reports the height and weight of 1,000 colored boys from a public school in New York City. The author concludes that colored boys grow faster than white boys in height and weight to the sixteenth year.

HOLMES, B.

1894. A STUDY OF CHILD GROWTH, BEING A REVIEW OF THE WORK OF DR. WILLIAM TOWNSEND PORTER, OF ST. LOUIS *N Y Med. Jour.* 60: [417]-423, illus.

Discusses Porter's (see p. 26) results in detail and compares them with the measurements reported by other investigators

HOLT, L. E.

[n. d.]. STANDARDS OF NUTRITION AND GROWTH [8] p., illus. New York. Child Health Organization.

Includes tables prepared by Dr. Thomas D. Wood of heights and weights of boys and girls of different ages

— and HOWLAND, J.

1926. THE DISEASES OF INFANCY AND CHILDHOOD FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. Ed. 9, 1018 p., illus. New York and London, D. Appleton & Co.

Data on weight, height, and chest and head circumference are given, compiled chiefly from the work of other investigators and from a clinical rather than an anthropometric point of view.

HRDLIČKA, A.

1898. PHYSICAL DIFFERENCES BETWEEN WHITE AND COLORED CHILDREN. Amer. Anthropol. 11: 347-350.

Summarizes the physical differences between white and colored children noted in connection with a study of 1,400 children, 300 of whom were negroes. Some of the differences mentioned are that the average height of the colored child is 1 to 3 centimeters greater, the weight up to puberty is less, the arms are longer, and the arm spread, relative to the height of the body, is greater than of the white child.

1899. ANTHROPOLOGICAL INVESTIGATIONS OF ONE THOUSAND WHITE AND COLORED CHILDREN OF BOTH SEXES. THE INMATES OF THE NEW YORK JUVENILE ASYLUM, WITH ADDITIONAL NOTES ON ONE HUNDRED COLORED CHILDREN OF THE NEW YORK COLORED ORPHAN ASYLUM. N. Y. Juvenile Asylum Ann. Rpt. (1898) 47, 86 p., illus. New York and Albany, Wynkoop Hallenbeck Crawford Co.

Includes measurement of height, sitting height, arm expanse, weight, depth of chest, width of chest, and six dimensions of the head.

ILLINOIS DEPARTMENT OF PUBLIC HEALTH.

1921. ILLINOIS STANDARD WEIGHTS AND MEASUREMENTS OF NORMAL CHILDREN PREPARED BY ILLINOIS DEPARTMENT OF PUBLIC HEALTH. Ill. Health News 7: 154-157.

Two tables giving normals with minimum and maximum allowances for height, weight, circumference of head, chest, and abdomen, lateral diameter of chest, anteroposterior diameter of chest, length of arm and of leg of male and female children 3 to 72 months of age. The data were based on the measurements of 12,500 children. No methods of taking the measurements or details of the study are given.

IOWA CHILD WELFARE RESEARCH STATION, STATE UNIVERSITY OF IOWA.

1929. PHYSICAL TRAITS OF YOUNG CHILDREN. . . . Amer. Jour. Diseases Children 38: [541]-546.

Gives the means, standard deviations, probable errors, and coefficients of variation of 16 body measurements at 3-month intervals of 150 boys and 167 girls 3 to 6 years of age.

KIRKPATRICK, E. A.

1909. STUDIES IN DEVELOPMENT AND LEARNING. Arch. Psychol. No. 12, 101 p., illus. New York, The Science Press.

The first study of this series is "Physical Tests and Measurements," by L. G. Myers. It reports 13 body measurements of 560 boys and girls taken by students in the State normal school, Fitchburg, Mass., and is reprinted in Hyg. and Phys. Ed. 1: 335-338. 1909.

MACDONALD, A.

1899. EXPERIMENTAL STUDY OF CHILDREN, INCLUDING ANTHROPOMETRICAL AND PSYCHOPHYSICAL MEASUREMENTS OF WASHINGTON SCHOOL CHILDREN. U. S. Bur. Ed. Rpt. Commr. Ed. (1897/98) 1: 985-1204, illus.

Reports a study of 526 boys and 548 girls in Washington (D. C.) schools. Includes height, sitting height, arm reach, and circumference of head. Also gives data obtained by Bowditch, Peckham, and Porter. (See The Growth of Children, by Bowditch, p. 21; The Growth of Children, by Peckham, p. 26; and The Growth of St. Louis Children, by Porter, p. 26.)

1901. MEASUREMENT OF GIRLS IN PRIVATE SCHOOLS AND OF UNIVERSITY STUDENTS. Boston Med. and Surg. Jour. 145: 127-129, illus.

Gives height and weight of Washington (D. C.) and Chattanooga (Tenn.) schoolgirls and weight, height, and sitting height of some university women.

1905. MAN AND ABNORMAL MAN, INCLUDING A STUDY OF CHILDREN, IN CONNECTION WITH BILLS TO ESTABLISH LABORATORIES UNDER FEDERAL AND STATE GOVERNMENTS FOR THE STUDY OF THE CRIMINAL, PAUPER, AND DEFECTIVE CLASSES, WITH BIBLIOGRAPHIES. U. S. Cong. 58th, 3d sess., Senate Doc. 187: 1-350, illus.

Includes a report of the height, sitting height, arm reach, weight, and horizontal circumference of the head of 16,473 white and 5,457 colored children. Summarizes anthropometrical studies made by other investigators and describes instruments and methods of taking measurements.

MOON, S. B.

1899. THE QUESTION OF GROWTH AT PUBERTY. *Amer. Phys. Ed. Rev.* 4: 294-298.

Reports the increments of growth of total height, height of knee, and sitting height of 18 boys at puberty. (See also Seaver p. 18.)

MUSSELMAN, F., and CRAWFORD, C.

1903. TABLES OF GROWTH. *Mind and Body* 10: 7-9.

Brings together the heights and weights of children as determined by Bowditch, Christopher, Porter, and Sargent. (See p. 21, 26, and 39.)

MUSTARD, H. S., and WARING, J. I.

1926. HEIGHTS AND WEIGHTS OF COLORED SCHOOL CHILDREN. *Amer. Jour. Pub. Health* 16: 1017-1022, illus.

Reports heights and weights of 1,650 colored and 4,101 white children in Rutherford County, Tenn. Discusses differences in rate of growth of white and colored children and adults as reported by other investigators. Concludes that the colored race has a growth cycle which differs in many respects from that of the white.

MYERS, B.

1926. STATISTICS CONCERNING THE HEIGHT, WEIGHT, AND OTHER MEASUREMENTS OF FOURTEEN HUNDRED LONDON CHILDREN. *Brit. Jour. Children's Diseases* 23: 87-107.

Reports head, chest, and abdomen measurements, height sitting, height standing, and weight of London children. The measurements are classified by age and are given for children from birth to 14 years of age.

[OAKLAND, CALIFORNIA] BOARD OF EDUCATION.

1893. PHYSICAL DEVELOPMENT OF OAKLAND CHILDREN. [Oakland, Calif.] Bd. Ed. Rpt. Pub. Schools (1892-93): 38-44, illus.

Report average height standing, height sitting, weight, and finger reach of about 6,000 children in the Oakland, Calif., schools. The measurements were taken under the immediate supervision of E. Barnes, of Stanford University.

PECKHAM, G. W.

1882. THE GROWTH OF CHILDREN. *Wis. State Bd. Health Rpt.* (1881) 6: 28-73, illus.

Includes a report of weights, heights, and sitting heights of Milwaukee school children. Discusses the comparative rate of growth of the two sexes, effect of race and climate on height and weight, and effect of density of population on growth. The rate of growth of the body and of the lower extremities is also considered.

PORTER, W. T.

1893. ON THE APPLICATION TO INDIVIDUAL SCHOOL CHILDREN OF THE MEAN VALUES DERIVED FROM ANTHROPOLOGICAL MEASUREMENTS BY THE GENERALIZING METHOD. *Amer. Statis. Assoc. Quart. Pubs.* (n. s. 24) 3: 576-587.

Discusses the determination of abnormal deviations in the physical development of children.

1894. THE GROWTH OF ST. LOUIS CHILDREN. *Acad. Sci. St. Louis, Trans.* 6: 263-[426], illus.

Reports and analyzes the measurements of 18,059 girls and 16,295 boys in the St. Louis (Mo.) public schools. Includes age, weight, height standing, height sitting, span of arms, girth of chest, length of head, breadth of head, height of face, breadth of face, and hair line.

1895. THE PHYSICAL BASIS OF PRECOCITY AND DULLNESS. *Acad. Sci. St. Louis, Trans.* 6: [161]-181, illus. [Reprinted in *Amer. Phys. Ed. Rev.* 2: 155-173, illus. 1897.]

Includes data on the weight, standing height, girth of head, and width of head of school children.

1895. THE RELATION BETWEEN THE GROWTH OF CHILDREN AND THEIR DEVIATION FROM THE PHYSICAL TYPE OF THEIR SEX AND AGE. *Acad. Sci. St. Louis, Trans.* 6: [233]-250, illus.

A statistical study of some of the data obtained in a previous investigation. (See *The Growth of St. Louis Children.*) Includes data on the weight, standing height, sitting height, span of arms, and girth of chest.

PORTER, W. T.

1920. THE SEASONAL VARIATION IN THE GROWTH OF BOSTON SCHOOL CHILDREN. Amer. Jour. Physiol. 52: 121-131, illus.

An analysis of the change in height and weight of school children. Reports measurements of children examined monthly throughout their school life.

PYLE, W. H.

1920. A MANUAL FOR THE MENTAL AND PHYSICAL EXAMINATION OF SCHOOL CHILDREN. (Revised) Missouri Univ. Bul. 21 (12), 39 p., illus. (Ext. ser. 29).

Reports standing height, sitting height, and weight of urban and rural school children in Missouri.

— and COLLINGS, P. E.

1918. THE MENTAL AND PHYSICAL DEVELOPMENT OF RURAL CHILDREN. School and Soc. 8: 534-539, illus.

Reports standing height, sitting height, weight, lung capacity, grip, and speed of over 2,000 rural school children in a Missouri county and compares the values with those obtained by measuring school children in small towns, chiefly in Missouri. Of the children compared, there was practically no difference in standing height between country and town children. The town children had relatively longer bodies than the country children.

ROBERTSON, T. B.

1916. STUDIES ON THE GROWTH OF MAN. IV. THE VARIABILITY OF THE WEIGHT AND STATURE OF SCHOOL CHILDREN AND ITS RELATIONSHIP TO THEIR PHYSICAL WELFARE. Amer. Jour. Physiol. 41: 547-554, illus.

Reports a statistical study of the heights and weights of 50 California children of each sex and age, from 6 to 14 years, inclusive.

- [1923]. GROWTH AND DEVELOPMENT *In* Abt. I. A., ed. Pediatrics 1: 445-519, illus.

Discusses body changes due to growth and quotes data on height and weight of children of various nationalities. A bibliography of 164 references is included.

RUDE, A. E.

1922. PHYSICAL STATUS OF PRESCHOOL CHILDREN, GARY, IND. U. S. Dept. Labor, Children's Bur. Pub. 111, 84 p., illus. (Reprinted, 1924.)

Reports the examination of 3,125 children from 2 to 7 years of age in Gary, Ind. Only heights and weights are given.

SARGENT, D. A. (See p. 39.)

SILSBY, D. H.

1915. ANTHROPOMETRIC CHART. [2] p. Ann Arbor, Mich., George Wahr.

A chart representing 32 body measurements of 2,000 high-school boys arranged in percentile grades.

SMEDLEY, F. W.

1901. REPORT OF DIRECTOR FRED W. SMEDLEY. Chicago Bd. Ed. Ann. Rpt. 46: 47-116, illus.

This report is included in a report of the committee on child study and pedagogic investigation under the chairmanship of W. S. Christopher. Data on standing height, sitting height, and weight are recorded and analyzed.

STALNAKER, E. M.

1923. A COMPARISON OF CERTAIN MENTAL AND PHYSICAL MEASUREMENTS OF SCHOOL CHILDREN AND COLLEGE STUDENTS. Jour. Compar. Psychol. 3: 181-239, 431-468.

In connection with this study, weights, standing heights, trunk lengths, and chest circumferences were taken of 64 freshmen college students, 135 private-school pupils, and 425 grade-school pupils from 9 to 22 years of age. The results are reported as correlations with the results of mental tests. A bibliography of 120 references is given, including many on physical measurements

STEPHENSON, W.

1887. ON THE RATE OF GROWTH IN CHILDREN. Internatl. Med. Cong. Trans. 3 (9th sess.): 446-452, illus.

Includes data on height and weight of American and British children.

STILES, C. W., and WHEELER, G. A.

1915. HEIGHTS AND WEIGHTS OF CHILDREN. CLASSIFICATION, BY AGE AND BY SANITATION, OF 1,652 WHITE SCHOOL CHILDREN (771 BOYS, 881 GIRLS) IN THE CITY OF X. Pub. Health Rpts. [U. S.] 30: 2990-3003, illus. [Also published as Pub. Health Rpts. [U. S.], Reprint 303, 15 p., illus. Washington [D. C.] 1915.]

Gives data on heights, weights, and sitting heights of the children

STOCKTON-HOUGH, J.

1885. STATISTICS RELATING TO SEVEN HUNDRED BIRTHS (WHITE) OCCURRING IN THE PHILADELPHIA HOSPITAL (BLOCKLEY) BETWEEN 1865 AND 1872. Phila. Med. Times 16: 92-94.

Includes average measurements of entire length, trunk length, and weight of the new-born children.

TALBOT, F. B.

1924. STUDIES IN GROWTH. I. GROWTH OF NORMAL CHILDREN. Amer. Jour. Diseases Children 27: [541]-555, illus.

Curves are included showing the growth in weight, height, circumference of head, chest, and abdomen, and length of trunk, legs, feet, and arms of boys and girls during various age periods.

TARBELL, G. G.

1883. ON THE HEIGHT, WEIGHT, AND RELATIVE RATE OF GROWTH OF NORMAL AND FEEBLE-MINDED CHILDREN. Assoc. Med. Off. Amer. Inst. for Idiotic and Feeble-Minded Persons Proc. Ann. Sess. 6: 188-189, illus.

Reports heights and weights of inmates in an institution for feeble-minded children and compares these data with measurements of normal Boston children published by Bowditch. Throughout their entire period of growth subnormal children were reported to be 2 inches shorter and 9 pounds lighter on the average than normal children.

TAYLOR, C. K.

1914. THE PHYSICAL EXAMINATION AND TRAINING OF CHILDREN . . . 99 p., illus. Philadelphia, The John C. Winston Co.

Describes methods used in taking measurements of children. Gives tables of measurements of boys classified as to slender, slender-medium, medium, medium-heavy, and heavy types. Includes data on height, weight, shoulder girth, chest girth, chest expansion, right arm, left arm, waist, hips, right and left thighs, and right and left calves. These were obtained by averaging the measurements of a selected group of well-built healthy boys 9 to 16 years of age. The number measured is not given.

1916. STANDARDIZING THE BOY. Illus. World 24: 805-807, illus.

A popular presentation of the author's contention that the physical development of individuals should be considered in relation to their type. He divides boys into three main types, the "Hercules," the "Apollo," and the "Mercury."

1922. PHYSICAL STANDARDS FOR BOYS AND GIRLS . . . 56 p., illus. Orange, N. J., The Academy Press.

Emphasizes the fact that there are various types of build. Includes tables giving 11 measurements of slender, slender-medium, medium, medium-heavy, and heavy boys and girls. The measurements for girls are also divided into preadolescent and postadolescent. Measurements of height, weight, shoulder girth, chest, right arm, left arm, waist, hips, thighs, and calves are included.

TAYLOR, R.

1919. THE MEASUREMENTS OF 250 FULL-TERM, NEW-BORN INFANTS. Amer. Jour. Diseases Children 17: [353]-362, illus.

Reports 16 measurements of 250 new-born infants; 125 of each sex.

UNITED STATES DEPARTMENT OF LABOR, CHILDREN'S BUREAU.

1921. AVERAGE HEIGHTS AND WEIGHTS OF CHILDREN UNDER SIX YEARS OF AGE. U. S. Dept. Labor, Children's Bur. Pub. 84, 4 p. (Community Child-Welfare ser. 2) [Reprint from Jour. Heredity 12: 208-209.]

Gives a table of the height and weight of white children from birth to 6 years of age, based on the measurement of 167,024 white boys and girls for whom no serious defects were reported. Also includes a table of average weights, by height and sex, of white children, based on the same number of measurements



## UNITED STATES DEPARTMENT OF LABOR, CHILDREN'S BUREAU.

1927. REFERENCES ON THE PHYSICAL GROWTH AND DEVELOPMENT OF THE NORMAL CHILD. U. S. Dept. Labor, Children's Bur. Pub. 179, 353 p., illus.

An annotated list of approximately 2,500 articles on the growth of the body, the metabolism, adolescence, and puberty of the normal child. Articles on standards and methods of judging physical fitness in children are also included.

WEISMAN, S. A. (See p. 40.)

WEST, G. M.

1893. WORCESTER SCHOOL CHILDREN. THE GROWTH OF THE BODY, HEAD, AND FACE. *Science* 21: 2-4, illus.

Growth curves and a general discussion of the growth of the head, face, stature, sitting height, and weight are given.

1894. THE ANTHROPOMETRY OF AMERICAN SCHOOL CHILDREN. *In* Wake, C. S., ed., *Mem. Internatl. Cong. Anthropol.* [1893]: [50]-58.

An analysis of data collected by various investigators relating to the laws governing the development of children from the cities of Toronto, Canada, Oakland, Calif., Boston, Mass., Milwaukee, Wis., St. Louis, Mo., and Worcester, Mass. A comparison is made of the rate of growth of the sexes and of children in different localities.

1896. THE GROWTH OF THE HUMAN BODY. Ed. Rev. 12: 284-289.

General discussion of growth of American and European boys and girls. Points out some of the most outstanding characteristics in growth rate.

WOODBURY, R. M.

1921. STATURES AND WEIGHTS OF CHILDREN UNDER SIX YEARS OF AGE. U. S. Dept. Labor, Children's Bur. Pub. 87, 117 p., illus. (Community Child-Welfare ser. 3.)

Statistical study of the heights and weights of 172,000 white and colored children. The data on white children are also given in *Amer. Jour. Phys. Anthropol.* 4: 269-273. (1921.) Also discussed in *Amer. Jour. Phys. Anthropol.* 2: 195-197. (1919.)

1922. STATURES AND WEIGHTS OF CHILDREN UNDER SIX YEARS OF AGE. *Amer. Jour. Phys. Anthropol.* 5: 5-16.

A summary of the results of a statistical analysis of material gathered by the United States Children's Bureau on statures and weights of children under 6 years of age. (See preceding reference.) Criticized in a Special Communication by F. Boas in *Amer. Jour. Phys. Anthropol.* 5: 279-282.

## MEASUREMENTS OF ADULTS

## ARMY AND NAVY ANTHROPOMETRY

As the following references indicate, extensive data are available concerning the height, weight, and chest girth of men enrolled in the United States Army and Navy since Civil War times. In a few instances other measurements are available, but with one exception they are of little real value to the clothing trade.

BAXTER, J. H.

1875. STATISTICS, MEDICAL AND ANTHROPOLOGICAL, OF THE PROVOST MARSHAL GENERAL'S BUREAU, DERIVED FROM RECORDS OF THE EXAMINATION FOR MILITARY SERVICE IN THE ARMIES OF THE UNITED STATES DURING THE LATE WAR OF THE REBELLION OF OVER A MILLION RECRUITS, DRAFTED MEN, SUBSTITUTES, AND ENROLLED MEN. 2 v., illus. Washington, D. C., Government Printing Office.

Reports the results of the physical examination of approximately half a million men examined in connection with the drafting of men for the Civil War. Includes the measurement of height, girth of chest, expansion of chest, age, and weight under the supervision of the Provost Marshal General's Bureau of the War Department. An outline of the history of anthropometry is given as well as an extensive bibliography.

BEAN, R. B. (See The Sitting Height, p. 40.)

BEYER, H. G.

1893. OBSERVATIONS ON NORMAL GROWTH AND DEVELOPMENT OF THE HUMAN BODY UNDER SYSTEMATIZED EXERCISE. U. S. Navy, Surg.-Gen. [Ann.] Rpt. 1893: 141-160. [Reprinted in First Pan-Amer. Med. Cong. Trans. 1893, 2 v., illus. 1895.]

Includes tables of heights and weights of United States Naval Academy cadets.

1894. ON NORMAL GROWTH UNDER SYSTEMATIZED EXERCISE IN THE GYMNASIUM. U. S. Navy, Surg. Gen. [Ann.] Rpt. 1894: 110-119.

Reports average height, weight, lung capacity, and strength of United States Naval Academy cadets.

1895. NORMAL GROWTH UNDER THE INFLUENCE OF EXERCISE. U. S. Navy, Surg. Gen. [Ann.] Rpt. 1895: 164-168.

Reports average height, weight, lung capacity, and strength of United States Naval Academy cadets. Also gives average measurement of these items for each year from 1892 to 1895.

1895. THE GROWTH OF U. S. NAVAL CADETS. U. S. Naval Inst. Proc. 21: [297]-333, illus.

Reports height standing, perineal height, circumference of chest, waist measure, lung capacity, height sitting, span of arms, strength of squeeze, and acuteness of vision and hearing of naval cadets over a period of 30 years. A discussion of statistical methods is also included.

1896. THE INFLUENCE OF EXERCISE ON GROWTH. Jour. Expt. Med. 1: 546-558. [Reprinted in Amer. Phys. Ed. Rev. 1: 76-87. 1896. Criticized by E. H. Arnold in Amer. Phys. Ed. Rev. 3: 67-69. (1898); also by Doctor Lincoln *ibid.* 5: 337-338. (1900.) Reply to Doctor Lincoln by Doctor Beyer in *ibid.* 5: 338-341. Letter to the editor of Amer. Phys. Ed. Rev. by E. H. Arnold in *ibid.* 5: 341-342; and reply to Doctor Arnold by Doctor Beyer in *ibid.* 5: 342-344.]

Reports average height, weight, lung capacity, and strength of naval cadets and shows that these measurements increase with gymnasium exercise.

1896. ON NORMAL GROWTH UNDER THE INFLUENCE OF GYMNASIUM EXERCISE. U. S. Navy, Surg. Gen. [Ann.] Rpt. 1896: 206-212.

Reports average height, weight, and lung capacity of cadets at the United States Naval Academy.

COOLIDGE, R. H.

1856. STATISTICAL REPORT ON THE SICKNESS AND MORTALITY IN THE ARMY OF THE UNITED STATES COMPILED FROM THE RECORDS OF THE SURGEON GENERAL'S OFFICE, EMBRACING A PERIOD OF SIXTEEN YEARS FROM JANUARY, 1839 TO JANUARY, 1855. U. S. Cong. 34th, 1st sess., Senate Doc. 96, 703 p. Washington [D. C.], A. O. P. Nicholson.

A few figures are given on height and weight of men in the recruiting service.

ELLIOTT, E. B.

1863. ON THE MILITARY STATISTICS OF THE UNITED STATES OF AMERICA. 44 p., illus. Berlin, R. v. Decker.

A paper presented at the fifth session of the International Statistical Congress at Berlin. Reports weight, height to seventh cervical vertebra, height to perineum, length of arm, breadth of neck, breadth at the shoulders, breadth at the pelvis, circumference of chest, circumference of waist, length and circumference of foot, and certain head measurements of volunteers in the Civil War.

FRY, J. B.

1866. HISTORICAL REPORT OF THE MEDICAL BRANCH PROVOST MARSHAL GENERAL'S BUREAU. In House Exec. Doc. v. 4 (no. 1, pts. 1-2), p. 238-700. (U. S. Cong. 39th, 1st sess., Doc. 8.)

Table 158 of this report gives, by States, the average height and chest measurements at expiration and inspiration of 237,391 drafted men, recruits, and substitutes, natives of the United States, examined for military service.

GIHON, A. L.

1887. PHYSICAL MEASUREMENTS. In Buck, A. H., ed., Reference Handbook Med. Sciences 5: 667-673, illus.

Includes tables giving height, weight, and chest girth of cadets at the United States Naval Academy. Also quotes data obtained by Bowditch, Hitchcock, Elliott, Coolidge, Gould, and Baxter. (See also United States Navy Department, p. 32.)

GOULD, B. A.

1869. INVESTIGATIONS IN THE MILITARY AND ANTHROPOLOGICAL STATISTICS OF AMERICAN SOLDIERS. [U. S. Sanit. Comm. Mem. Statis.] 655 p., illus. New York, Hurd & Houghton.

Reports a comprehensive study of data available in the military records of the Civil War in regard to enlistments and nativity, age, and stature of the men in the Federal Army. Includes data on physical measurements of white, colored, and Indian soldiers, sailors, and marines, collected under the direction of the United States Sanitary Commission. The body measurements of approximately 23,000 men are reported and partly analyzed. The andrometer, an instrument devised by an English tailor for determining the proper size for soldiers' clothing, is described.

GREENLEAF, C. R.

1890. AN EPITOME OF TRIPLER'S MANUAL AND OTHER PUBLICATIONS ON THE EXAMINATION OF RECRUITS. 70 p. Washington, D. C., William Ballantyne & Sons.

Gives the minimum and maximum weights allowed at that time for recruits and a table of average proportions including weight, height, and chest measurement.

HOFFMAN, F. L.

[1918]. ARMY ANTHROPOMETRY AND MEDICAL REJECTION STATISTICS. 114 p., illus. [Newark, N. J., Prudential Press.]

A plea for a more scientific physical examination of Army recruits. Points out the inaccuracies of the present methods and emphasizes that much of the data collected up to the present time is unreliable. Includes summaries and statistical analyses of some of the available data on height, weight, and chest measure as given in military records. A national anthropometric survey is urged.

IRELAND, M. W., DAVENPORT, C. B., and LOVE, A. G.

1921. THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY IN THE WORLD WAR. STATISTICS. PART ONE. ARMY ANTHROPOLOGY . . . v. 15 (pt. 1), 635 p., illus. Washington [D. C.].

Describes apparatus and methods used in the measurement of 100,000 soldiers during the demobilization period of the World War for the purpose of securing patterns for uniforms and the proper distribution of sizes of uniforms to the different areas covered by the distribution zones of the Quartermaster Corps. A detailed analysis of the data is included. Average measurements of 22 size classes of both the "blouse" and the "breeches" group, correlations and frequency distributions, are given as well as measurements recommended for manikins to be built for clothing construction. The distribution of men of various statures, chest, and waist dimensions throughout the country is reported.

KILBOURNE, H. S.

1897. THE PHYSICAL PROPORTIONS OF THE AMERICAN SOLDIER. Assoc. Mil. Surg. U. S. Proc. 7: 328-339.

Quotes data on height, chest girth, and weight of native white, negro, Indian, and foreign-born white men, chiefly from reports of the Surgeon General, U. S. Army. Gives the average heights of the immigration classes of the United States.

MACDONALD, A.

1918. ANTHROPOMETRY OF SOLDIERS. 17 p. New York, William Wood & Co. [Reprint from Med. Rec. [New York] 94: 1023-1027.]

Includes tables giving heights and chest girths of soldiers of various countries. (See also MacDonald, p. 42.)

MANCHESTER, H. H.

1926. RECENT INVESTIGATIONS OF AVERAGE PROPORTIONS. Clothing Trade Jour. 27: 18-20.

Discusses the studies on the physical measurement of men during the World War mobilization (see Ireland, M. W., Davenport, C. B., and Love, A. G.) and points out the importance of the results to the clothing manufacturer. Quotes many of the data obtained.

## UNITED STATES NAVY DEPARTMENT, SURGEON-GENERAL'S OFFICE.

1880. REPORT OF THE SURGEON-GENERAL OF THE UNITED STATES NAVY FOR THE YEAR 1879. U. S. Sec. Navy Rpt. 1879-80: 171-224.

On pages 183-205 an excerpt is given from a report by Medical Director Gihon of the physical examination of 6,129 candidates for admission and students in the United States Naval Academy. The mean weight, height, circumference of thorax, expansion, vital capacity, and strength of men 13 to 27 years of age are given. A table also shows the probable relation of vertico-perineal to total height at different periods of adolescence.

## [UNITED STATES.] OFFICE OF THE PROVOST MARSHAL GENERAL.

1918. STANDARDS OF PHYSICAL EXAMINATION FOR THE USE OF LOCAL BOARDS, DISTRICT BOARDS, AND MEDICAL ADVISORY BOARDS UNDER THE SELECTIVE SERVICE REGULATIONS. Form 75, ed. 2, 72 p. Washington [D. C.], Government Printing Office.

Contains a table of standard accepted measurements and permissible variations in height, weight, and chest measurements for registrants under the selective-service regulations.

## [UNITED STATES WAR DEPARTMENT.]

1918. PHYSICAL EXAMINATION FOR ENTRANCE INTO THE ARMY OF THE UNITED STATES BY VOLUNTARY ENLISTMENT OR BY INDUCTION UNDER THE SELECTIVE SERVICE LAW. 76 p. Washington [D. C.], Government Printing Office. (Spec. Regulat. 65.)

Includes a table of standard accepted measurements for height, weight, and circumference of chest governing entrance into the United States Army.

## [UNITED STATES] WAR DEPARTMENT. SURGEON GENERAL'S OFFICE.

1893-98. REPORT OF THE SURGEON-GENERAL OF THE ARMY TO THE SECRETARY OF WAR . . . [Annual reports for years 1893 to 1898, inclusive.] Washington [D. C.], Government Printing Office.

Table XXV (Ann. Rpt. 1893) gives the average height, weight, and chest measure of 9,585 recruits accepted for the United States Army during the year 1892 (white, 8,555; colored, 833; Indian, 197).

Table XXII (Ann. Rpt. 1894) gives average height, weight, and chest measure of 8,813 recruits accepted for the United States Army during the year 1893 (white, 8,208; negro, 524; Indian, 81).

Table XXI (Ann. Rpt. 1895) gives average height, weight, and chest measure of 7,434 recruits accepted for the United States Army during the year 1894 (native white, 4,547; foreign-born white, 2,388; negro, 499).

Table XXI (Ann. Rpt. 1896) gives height, weight, and chest measure of 8,643 recruits accepted for the United States Army during the year 1895 (native white, 5,699; foreign-born white, 2,351; negro, 593).

Table XXI (Ann. Rpt. 1897) gives average height, weight, and chest measure of 8,654 recruits accepted for the United States Army during the year 1896 (native white, 5,835; foreign-born white, 2,151; colored, 668).

Table XX (Ann. Rpt. 1898) gives average height, weight, and chest measure of 9,226 recruits accepted for the United States Army during the year 1897 (native white, 6,062; foreign-born white, 2,371; colored, 793).

---

1905-16. REPORT OF THE SURGEON GENERAL OF THE ARMY TO THE SECRETARY OF WAR . . . [Annual reports for years 1905 to 1916, inclusive] Washington [D. C.], Government Printing Office.

The section on recruiting in each report contains an analysis of data on the height, weight, and chest measurements of recruits. In the reports for 1913 and 1916, American, Philippine, and Porto Rican recruits are included.

---

1926. REPORT OF THE SURGEON GENERAL U. S. ARMY TO THE SECRETARY OF WAR. 1926. 482 p., illus. Washington [D. C.], Government Printing Office.

Table 133 gives the average weights of different types of United States Army officers in various height and age groups in 1924, with the number of each type, age, and height.

WISSLER, C.

1924. DISTRIBUTION OF STATURE IN THE UNITED STATES. *Sci. Mo.* 18: 129-143, illus.

Analysis of some of the data on measurements of draft recruits published by the Surgeon General's office. (See p. 32.) Shows the variations in stature in various parts of the country and points out the need of more comprehensive studies along this line for the use of clothing manufacturers.

#### RECORDS COMPILED BY INSURANCE COMPANIES

Many interested in securing data for use in establishing sizes for pattern and garment manufacture have expected to secure assistance from the records of insurance organizations. Unfortunately, practically the only measurements taken by these companies are height and weight, and they are therefore of little value to the clothing trade. The following are typical of the publications issued by such groups.

ANONYMOUS.

1890. DR. GREENLEAF'S NEW TABLE OF PHYSICAL PROPORTIONS. *Baltimore Underwriter* 43: 303-304.

Emphasizes the value of Greenleaf's table of physical measurements based on a study of army recruits. (See p. 31.) Mentions the sources of some of the tables used by insurance companies and other available data.

ALLEN, J. A.

1867. MEDICAL EXAMINATIONS FOR LIFE INSURANCE. 143 p. Chicago, Horton & Leonard.

Includes a table of height, weight, and chest measurements to be used as a reference by examiners for life insurance. The source of these figures is not given.

ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS AND THE ACTUARIAL SOCIETY OF AMERICA.

1912-14. MEDICO-ACTUARIAL MORTALITY INVESTIGATION. 3 v. New York, Association of Life Insurance Medical Directors and the Actuarial Society of America.

Volume one contains an extensive analysis of the data on height and weight of men and women, based on records of life insurance companies accumulated from 1885 to 1900, inclusive.

BORING, E. G.

1920. PREDILECTION AND SAMPLING OF HUMAN HEIGHTS. *Science* (n. s.) 52: 464-466, illus.

An analysis of the heights of 221,819 men measured by the Association of Life Insurance Medical Directors and the Actuarial Society of America. The distribution curve shows a peak of 5 feet 8 inches, but an inversion just above the peak. There are fewer men recorded at 5 feet 9 inches than at 5 feet 10 inches. "We may hazard that the error occurred not so much in reading the measuring stick as in the acceptance by the examining physician of the person's own statement of his height. There may be a tendency for a person to prefer an even 8 or 10 inches in height to an odd 9."

DUBLIN, L. I.

1924. ANTHROPOMETRICAL SUPPLEMENT TO REPORT OF COMMITTEE OF DREYER'S WORK. *Assoc. Life Insurance Med. Dir. Amer. Abs. Ann. Proc.* 34: 162-181.

Includes data on height and spine lengths of male employees of the Metropolitan Life Insurance Company.

MOSS, R. E.

1900. HEIGHT AND WEIGHT TABLE COMPILED BY A COMMITTEE OF THE MEDICAL SECTION OF THE NATIONAL FRATERNAL CONGRESS, 1900. *Med. Examiner and Practitioner* 10: 299.

Records and discusses a height-weight table for men 18 to 55 years of age based on 133,940 examinations made by medical examiners of applicants for life insurance.

- PRUDENTIAL INSURANCE COMPANY OF AMERICA, ORDINARY DEPARTMENT.  
 1910. INFORMATION AND SUGGESTIONS FOR MEDICAL EXAMINERS. 52 p.  
 Newark, N. J., The Prudential Insurance Co. of America.  
 Contains a table of height and weight at varying ages, based on 74,162 accepted male applicants for life insurance as reported to the Association of Life Insurance Medical Directors, 1897, and a table showing the lowest, the average, and the highest weight of 58,855 insured women.
- S., T. B.  
 1885. REPORT OF THE MEDICAL DIRECTOR (DR. THOMAS A. FOSTER) OF THE "UNION MUTUAL LIFE INSURANCE COMPANY," PORTLAND, MAINE, UPON THE DEATH LOSSES FOR THE EIGHT YEARS ENDING 31 DECEMBER 1884. *Jour. Inst. Actuaries and Assurance Mag.* 25 (Pt. 4): 251-257.  
 Includes a table of relation of height to weight in which Doctor Foster's data on 1,121 cases are compared with data given by Hutchinson, Brent, and Macaulay.
- SHEPHERD, G. R.  
 1899. THE RELATION OF BUILD (I. E., HEIGHT AND WEIGHT) TO LONGEVITY. *Med. Examiner* 9: 209-213.  
 Includes a table giving height and weight of men at varying ages, based on 74,162 male applicants for life insurance, as reported to the Association of Life Insurance Medical Directors, 1897.
- 
1912. THE RELATION OF BUILD (I. E., HEIGHT AND WEIGHT) TO LONGEVITY. *Assoc. Life Insurance Med. Dir. Amer. Abs. Ann. Proc.*, 1906-11: 46-66.  
 Includes a table giving height and weight at varying ages, based on 74,162 accepted male applicants for life insurance.
- WEISSE, F. S.  
 1909. A TABLE OF STANDARD WEIGHTS FOR WOMEN. *Med. Rec.* [New York] 75: 13-16, illus.  
 Includes tables based on the study of the heights and weights of 59,525 insured girls and women ranging in height between 4 feet 1 inch and 6 feet 1 inch, and in age between 15 and 69 years, inclusive.
- 
1912. A STUDY OF CHEST AND ABDOMINAL MEASUREMENTS IN RELATION TO BUILD. *Med. Rec.* [New York] 82: 1020-1022.  
 An analysis of chest and abdominal measurements as related to height and weight, based on the weights and measurements of 3,035 healthy male adults on whose lives policies were issued by the Mutual Life Insurance Co. of New York during the years 1907-1911.
- 
1912. A TABLE OF STANDARD WEIGHTS FOR WOMEN. *Assoc. Life Insurance Med. Directors Amer. Abs. Proc. Ann. Meeting* 17-22: 199-206, illus.  
 Gives tables based on the heights and weights of 59,525 insured women.
- 
1915. A STUDY OF CHEST AND ABDOMINAL MEASUREMENTS IN RELATION TO BUILD. *Assoc. Life Insurance Med. Directors Amer. Proc.* (1912) 23: 129-137.  
 A study based on the weights and measurements of 3,035 healthy male adults on whose lives insurance policies were issued. Reports height, weight, chest, and abdomen measurements of men over 25 years of age.

#### MEASUREMENTS OF COLLEGE STUDENTS

During the period from 1890 to 1910 many physical directors in the colleges and universities of this country were deeply interested in body measurements as an indication of the physical status of the students. As a result standardized methods of taking and recording these measurements were worked out, and a great many detailed measurements were made on every student enrolled in physical-training classes. Some were published, but unfortunately many were taken unscientifically, and even those most carefully done were based on body landmarks which make them useless in garment and pattern manufacture.

## ANONYMOUS.

1895. [No title.] Phys. Ed. 4: 38-39, illus.

An editorial comment accompanied by an anthropometric table supplied by Dr. Delphine Hanna, of Oberlin College, who reports the average measurements of 1,600 women students and charts the measurements of women who have taken exercise. Fifty-five measurements are given.

1921. SPORTS DEVELOPING COLLEGE GIRLS INTO AMAZONS. N. Y. Herald May 8 (Sec. 7): 4.

A popular article emphasizing that women are increasing in height, weight, and strength. Quotes data from Bryn Mawr College and Smith College showing that the college girl of 1921 was stronger, taller, and heavier than college girls of previous years.

## ALLEN, N.

1869. PHYSICAL CULTURE IN AMHERST COLLEGE. 46 p. Lowell, Mass., Stone & Huse.

A summary of the work in physical training at Amherst from 1854 to 1869. Includes a table giving the average age, height, weight, chest girth, chest capacity, arm girth, and muscle strength of each academic class, averaged for a period of 8 years.

## AMHERST COLLEGE.

1890. ANTHROPOMETRIC TABLES CONSTRUCTED ON THE STANDARD OF STATURE AS DETERMINED BY MEASUREMENTS OF AMHERST COLLEGE STUDENTS. [20 p.] Amherst, Mass., The Amherst Record, Book and Job Press.

Gives two tables. One shows under 55 items the average measurements of body proportions and tests of strength obtained during the college years 1861-62 to 1888-89 from 8,000 Amherst students 17 to 26 years of age. The second table shows under the same items the average measurements classified according to stature.

## ANDERSON, W. G.

1885. STUDENTS IN GYMNASIUM. *Adelphian* 5: 10-11.

Reports the height, weight, and lung capacity of approximately 1,000 boys and girls 11 to 16 years of age attending Adelphi Academy in Brooklyn, N. Y. These are compared with children's measurements taken in England and in Boston, Mass.

## BARR, A. L.

1903. SOME ANTHROPOMETRIC DATA OF WESTERN COLLEGE GIRLS. *Amer. Phys. Ed. Rev.* 8: 245-248.

Compares data on the physical measurements of Wellesley College and University of Nebraska girl students. No tables are given. Concludes that the western girl is lighter in weight and shorter than the eastern girl, but has greater chest measurements and larger waist and hip girths. The western girl is the long-trunk and short-leg type.

## BEAN, R. B.

1906-8. A PRELIMINARY REPORT ON THE MEASUREMENTS OF ABOUT 1,000 STUDENTS AT ANN ARBOR, MICHIGAN. *Anat. Rec.* 1: 67-68.

Reports that 910 boys and 116 girls in the freshman class at the University of Michigan in 1905 were measured. Height, weight, chest girth, color of hair and eyes, and length, breadth, and height of head were among the measurements taken. No data are included. (See also p. 40.)

## BEMIES, C. O.

1900. PHYSICAL CHARACTERISTICS OF THE RUNNER AND JUMPER. *Amer. Phys. Ed. Rev.* 5: 235-245.

Compares 43 average measurements of different parts of the body of 2,300 Yale students with the average measurements of 5 Michigan Agricultural College winners of first place in various events of the Michigan Intercollegiate Athletic Association. The measurements of the athletes are also compared with the proportions of the human figure used by art schools.

## CLAPP, A. B. (See also Seaver, p. 18.)

## COOK, R. J.

1923. POSTURAL DEFECTS IN COLLEGE MEN. *Amer. Phys. Ed. Rev.* 28: 169-172.

Reports the examination of 2,200 Yale University freshmen for postural defects. Gives the percentage having such defects as round shoulders, flat chests, and prominent abdomens.

DICKSON, S. H.

1858. SOME ADDITIONAL STATISTICS OF HEIGHT AND WEIGHT. *Charleston Med. Jour. and Rev.* 13: 494-506.

Reports the height and weight of young men medical students in various parts of the country. Also gives heights and weights of a few women attending private schools.

1866. STATISTICS OF HEIGHT AND WEIGHT. *Amer. Jour. Med. Sci. (n. s.)* 52: 373-380.

Reports height and weight of American young men and women in various schools and compares them with other races. The data on American girls are among the earliest reported. Quotes data from other papers by the author.

ELSON, J. C.

1910. STATISTICS REGARDING SHORT-COURSE STUDENTS. UNIVERSITY OF WISCONSIN, SEASON 1909-1910. *Amer. Phys. Ed. Rev.* 15: 348-349.

Gives 16 body measures, the averages of 150 farm boys attending the short course at the University of Wisconsin, and compares these with averages of the same measurements of the college freshmen and of 8,000 college students of all classes.

ENEBUSKE, C. J.

1893. AN ANTHROPOMETRICAL STUDY OF THE EFFECTS OF GYMNAS TIC TRAINING ON AMERICAN WOMEN. *Amer. Statis. Assoc. Quart. Pubs. (n. s.)* 24 3: 600-610.

Reports height, weight, and strength of 100 junior women students of Boston Normal School of Gymnastics.

1893. SOME MEASURABLE RESULTS OF SWEDISH PEDAGOGICAL GYMNAS TICS. *Amer. Assoc. Adv. Phys. Ed. Ann. Proc.* 7: 207-235, illus.

Reports 31 body measurements, averages resulting from measuring 26 women students of the Boston Normal School of Gymnastics. Measurements before and after a 7-months course in Swedish gymnastics are given.

FOSTER, A. B.

1894. A FEW FIGURES ON OCCUPATION AND EXERCISE. *Amer. Assoc. Adv. Phys. Ed. Ann. Rpt.* 9: 72-81, illus.

Gives tables of 49 items of body measurements, averages resulting from the measurement of freshmen and sophomore girls at the University of Chicago. These are compared with measurements taken after three months of gymnastic work and with measurements of Wellesley College and Oberlin College students.

GITTINGS, I. E.

1927. CORRELATION OF MENTAL AND PHYSICAL TRAITS IN UNIVERSITY OF ARIZONA FRESHMEN WOMEN. *Amer. Phys. Ed. Rev.* 32: 569-583, illus.

Includes data on weight and height of 75 freshmen women at the University of Arizona in 1923.

GRAY, H., and PARMENTER, D. C.

1923. CHEST DEPTH AS AN INDEX OF BODY WEIGHT. *Jour. Amer. Med. Assoc.* 81: 2183.

Gives the body weight, shoulder width, transverse chest diameter, and depth of chest of 100 candidates for a varsity football team. Attempts to determine what body width should be considered in connection with height in advising as to correct body weight.

HANNA, D.

1895. ANTHROPOMETRIC TABLE. *Phys. Ed.* 4: 38-39.

Shows the effect of exercise upon the measurements of 1,600 Oberlin College girls. (See also Seaver, p. 18.)

HITCHCOCK, E.

1881. A REPORT OF TWENTY YEARS EXPERIENCE IN THE DEPARTMENT OF PHYSICAL EDUCATION AND HYGIENE IN AMHERST COLLEGE TO THE BOARD OF TRUSTEES. 18 p. Amherst, Mass., C. A. Bangs & Co.

Describes the methods of taking body measurements at Amherst College. Includes tables giving average data on body measurements accumulated during a 20-year period. Twelve different measurements taken of 2,106 students are reported classified by college class and by age. Averages of six measurements of 34,384 students are also given.



HITCHCOCK, E.

1888. AVERAGE AND MEAN ANTHROPOMETRIC DATA OF AMHERST COLLEGE STUDENTS. [2] p. [n. p.]

A table and short discussion of the measurements of the average student and of the mean student in Amherst College as calculated from data collected from 1861 to 1888, inclusive. Thirty-two body measurements are given.

1890. ANTHROPOMETRY. Amer. Assoc. Adv. Phys. Ed. Ann. Proc. 5: 6-8.

Includes a table showing under 55 items average body measurements, and tests of strength obtained during the college years 1861-62 to 1888-89 from a study of nearly 8,000 Amherst College students 17 to 26 years of age.

1890. A SYNOPSIS EXHIBIT OF 15,000 PHYSICAL EXAMINATIONS. Amer. Assoc. Adv. Phys. Ed. Ann. Proc. 5: 5.

A table of averages obtained by the physical examination of nearly 15,000 recorded examinations of students at Yale University, Amherst College, and Cornell University. Fifty items are given.

1891. TO THE TRUSTEES OF AMHERST COLLEGE. THE THIRTIETH ANNUAL REPORT OF THE PROFESSOR OF HYGIENE AND PHYSICAL EDUCATION. June 23, 1891. 20 p., illus. Amherst, Mass., Carpenter & Morehouse.

A table giving averages of 52 body measurements is appended. These are classified as the averages of 2,000 measures, the mean measures of 2,086 students, and the averages of students 21 years old.

1891. A COMPARATIVE STUDY OF AVERAGE MEASUREMENTS. Amer. Assoc. Adv. Phys. Ed. Ann. Proc. 6: 37-42.

Compares 52 body measurements representing averages of measurements taken on Amherst College students with similar measurements of Mount Holyoke College and Wellesley College students.

1891. COMPARATIVE STUDY OF MEASUREMENTS OF MALE AND FEMALE STUDENTS AT AMHERST, MOUNT HOLYOKE, AND WELLESLEY COLLEGES, U. S. A. *Physique* [London] 1: 90-94.

Includes a table giving 52 average measurements of 2,000 men students averaging 21 years and 1 month in age and of 326 men 21 to 22 years old; and the "mean" measurements of the same items as found on 2,086 students, the average age of whom was 21 years 1 month. Data are also given comparing the average measurements of the same 52 items on 500 Amherst College students of average age of 19 years and on 500 Mount Holyoke College and Wellesley College students of the same average age.

1892. THE RESULTS OF ANTHROPOMETRY AS DERIVED FROM THE MEASUREMENTS OF THE STUDENTS IN AMHERST COLLEGE . . . 7 p. Amherst, Mass., Carpenter & Morehouse.

Reports the results of physical measurements of 3,000 Amherst College students, made over a period of 30 years. Approximately 52 measurements were taken, including various strength determinations. Data are arranged in tables according to averages, mean proportions, ages, and percentiles.

1893. ANTHROPOMETRIC STATISTICS OF AMHERST COLLEGE. Amer. Statis. Assoc. Quart. Pubs. (n. s. 24) 3: 588-599.

Reports age, weight, height, chest girth, arm girth, forearm girth, finger reach, horizontal length, and sitting height of Amherst College students from 1861 to 1893.

and SEELYE, H. H.

1893. AN ANTHROPOMETRIC MANUAL GIVING PHYSICAL MEASUREMENTS AND TESTS OF MALE COLLEGE STUDENTS AND METHODS OF SECURING THEM. Ed. 3, 35 p. Amherst, Mass., Carpenter & Morehouse.

Gives directions for obtaining anthropometric measurements of the body and recording the data. List of manufacturers of the necessary instruments is included. Contains a table of 56 average measurements of 1,322 students between 17 and 26 years of age used for comparative purposes and another table of classified measurements of approximately 1,400 students.

JACKSON, C. M.

1927. THE PHYSIQUE OF MALE STUDENTS AT THE UNIVERSITY OF MINNESOTA: A STUDY IN CONSTITUTIONAL ANATOMY AND PHYSIOLOGY. *Amer. Jour. Anat.* 40: 59-126, illus.

Statistical study of measurements of 1,633 male entrants to the University of Minnesota during the school year 1924-25. Reports data on weight, height, sitting height, and chest circumference.

1927. A STATISTICAL STUDY OF THE RELATIONSHIPS BETWEEN BODY BUILD AND VARIOUS PHYSIOLOGICAL MEASUREMENTS OF MALE UNIVERSITY STUDENTS. (Abstract) *Anat. Rec.* 35: 15-16.

Brief report of measurements on 1,633 entrants to the University of Minnesota, including 267 of purely Scandinavian and 107 of German descent. Height, weight, chest circumference, and sitting height were included in the measurements taken. The correlations of these with each other and other physiological measurements are given.

1929. PHYSICAL MEASUREMENTS OF THE FEMALE STUDENTS AT THE UNIVERSITY OF MINNESOTA, WITH SPECIAL REFERENCE TO BODY BUILD AND VITAL CAPACITY. *Amer. Jour. Phys. Anthropol.* 12: 363-413, illus.

Measurements of 1,022 women entering the University of Minnesota during the school year 1925-26 are given. Height, sitting height, body weight, chest girth, and chest expansion are among the measurements taken.

— and LEES, H. D.

1929. THE CORRELATION BETWEEN VITAL CAPACITY AND VARIOUS PHYSICAL MEASUREMENTS IN ONE HUNDRED HEALTHY MALE UNIVERSITY STUDENTS. *Amer. Jour. Physiol.* 87: 654-666.

Includes the mean values of the age, stature, sitting height, weight, chest girth, umbilical girth, and trunk girth for the 100 men examined.

JOHNSON, M. M.

1911. A STUDY IN SURFACE ANATOMY WITH SPECIAL REFERENCE TO THE POSITION OF THE UMBILICUS. *Anat. Rec.* 5: 461-471, illus.

Reports some body measurements of 650 men and 350 women, freshmen at the University of California during the year 1910-11.

MACDONALD, A. (See p. 25.)

MEYLAN, G. L.

1908. THE VALUE OF PHYSICAL EXAMINATIONS OF COLLEGE STUDENTS. *Amer. Phys. Ed. Rev.* 13: 250-252.

Includes data on the average measurements of Columbia University freshmen 17, 18, and 19 years of age. Forty body measurements are included.

1908. SOME PHYSICAL CHARACTERISTICS OF COLLEGE STUDENTS. *Science* (n. s.) 27: 711-713.

Reports average measurements of 790 Columbia University men students 17, 18, and 19 years old. Approximately 40 measurements are given. The nationality of 283 students in the class of 1911 is included.

MILES, W. R.

1928. HUMAN BODY WEIGHT: I. CORRELATIONS BETWEEN BODY WIDTHS AND OTHER PHYSICAL MEASUREMENTS ON YOUNG MEN. *Science* (n. s.) 68: 382-386.

Reports ranges, means, variability values, and intercorrelations of the height, sitting height, body weight, maximum diameter at the iliac crests, and shoulder diameter at the acromions of 552 American men, average age about 19 years, all entering students at Stanford University in October, 1927.

MOSHER, C. D.

1921. CONCERNING THE SIZE OF WOMEN. PRELIMINARY NOTE WITH SPECIAL REFERENCE TO HEIGHT. *Calif. State Jour. Med.* 19: 53-54.

Reports the average height of 4,023 women students of Leland Stanford University in year groups from 1891-92 to 1920-21, inclusive. These are also grouped by 10-year periods. The author concludes that the average height of women increased 1 to 1.1 inches in 30 years.

MOSHER, C. D.

1921. THE HEIGHT OF COLLEGE WOMEN. (SECOND NOTE.) *Med. Woman's Jour.* 28: 274-276.

Reprints a report previously published (see preceding reference), with additions and revisions. A discussion of the birthplaces of the students is added, together with a table classifying 2,023 students according to the State in which they were born.

1923. SOME OF THE CAUSAL FACTORS IN THE INCREASED HEIGHT OF COLLEGE WOMEN. THIRD NOTE. *Jour. Amer. Med. Assoc.* 81: 535-538, illus.

The heights of women attending Stanford University, Smith College, and Vassar College from 1884 to 1920 are reported and discussed in their relation to the place of birth of the women and changes in fashion during that period.

NEWCOMER, M.

1921. PHYSICAL DEVELOPMENT OF VASSAR COLLEGE STUDENTS, 1884-1920. *Amer. Statis. Assoc. Quart. Pubs.* (n. s. 136) 17: 976-982.

Statistical study of height, weight, waist girth, and capacity of lungs of Vassar College students from 1884-1920. Includes the percentage distribution of students according to residence in 1890-91 and 1920-21.

PALMER, G. L.

1929. THE PHYSICAL MEASUREMENTS OF HOLLINS FRESHMEN, 1920-1927. *Jour. Amer. Statis. Assoc.* (n. s. 165) 24: 40-49, illus.

Reports standing and sitting heights, weight, chest girth, and vital capacity of freshman girls at Hollins College. Compares them with the measurements of women of other colleges.

PASMORE, E. E., and WEYMOUTH, F. W.

1924. THE RELATION OF VITAL CAPACITY TO OTHER PHYSICAL MEASUREMENTS IN WOMEN. *Amer. Phys. Ed. Rev.* 29: 166-175, illus.

Includes data on height, sitting height, weight, chest circumference, and surface area of women students at Stanford University.

PECKHAM, G. W.

1883. VARIOUS OBSERVATIONS ON GROWTH. *Wis. State Bd. Health Rpt.* (1882) 7: 185-188.

Reports heights and weights of students at Beloit College, Beloit, Wis.

PHILLIPS, P. C.

[n. d.]. AN ANTHROPOMETRIC STUDY OF THE STUDENTS OF AMHERST COLLEGE TO DETERMINE THE NORMS FOR DIFFERENT HEIGHTS AT EACH AGE FOR SEVENTEEN TO TWENTY-TWO YEARS. [8] p. [n. p.]

A study based on measurements of 2,700 men of Amherst College from 1881 to 1904. The norms of 13 physical measurements for different heights of each age of men 17, 18, 19, 20, 21, and 22 years old are tabulated.

1904. IS THE PHYSIQUE OF THE AMERICAN COLLEGE-MAN AND WOMAN DEGENERATING? *Amer. Phys. Ed. Rev.* 9: 125-128.

Compares the height, weight, and chest girth of students of Smith, Wellesley, Mount Holyoke, Oberlin, and Amherst Colleges and the University of Chicago during various periods from 1883 to 1903.

RICHARDS, A., and LITTLE, B. B.

1896. A PROPOSED STANDARD CHART TO SHOW THE PROPORTIONS OF AMERICAN FEMALES. *Amer. Assoc. Adv. Phys. Ed. Ann. Rpt.* 10: 30-34.

Reports 40 measurements on girls selected by the instructors of the Anderson Normal School in New Haven, Conn., as being well built.

SARGENT, D. A.

1889. THE PHYSICAL DEVELOPMENT OF WOMEN. *Scribner's Mag.* 5: [172]-185, illus.

Reports mean values for 42 body measurements of 1,200 boys and girls and 4,000 college students of both sexes. Reprints the tables of F. Galton compiled from measurements taken in England at the International Health Exhibition in 1884.

STALNAKER, E. M. (See p. 27.)

TUCKERMAN, F.

1888. [ANTHROPOMETRIC DATA BASED UPON NEARLY 3,000 MEASUREMENTS TAKEN FROM STUDENTS.] [1] p. Amherst.

Reports anthropometric data based upon nearly 3,000 measurements taken from 52 students of the three upper classes of the Massachusetts Agricultural College during the academic year, 1884-85. The average results of 17 different items of body measurements are given. A table showing the percentage difference between the two sides of the body of 18 different measurements and tests is also included.

WASHINGTON, M. (See Wilder, p. 19.)

WEISMAN, S. A.

1927. CONTOUR OF NORMAL AND TUBERCULOUS CHESTS. *Jour. Amer. Med. Assoc.* 89: 281-284, illus.

Includes a report of the average thoracic indices for normal chests as found by measuring groups of University of Minnesota male students and boys and girls in Minneapolis public schools.

1929. FURTHER OBSERVATIONS ON THE CONTOUR OF NORMAL AND OF TUBERCULOUS CHESTS. *Arch. Int. Med.* 44: [29]-36, illus.

The indices of thoracic measurements are reported. The normal persons measured were University of Minnesota students.

WILDER, H. H., and PFEIFFER, M. W.

1924. THE BODILY PROPORTIONS OF WOMEN IN THE UNITED STATES; BASED UPON MEASUREMENTS TAKEN FROM ONE HUNDRED SMITH COLLEGE STUDENTS. *Amer. Acad. Arts and Sci. Proc.* 59 (16): [441]-603, illus.

The measurements of 100 Smith College students 17 to 27 years of age are reported and analyzed. These include 45 different measurements on each.

WOOD, M. A. (See Seaver, p. 18.)

#### MISCELLANEOUS

ANONYMOUS.

1867. SENATORS OF THE 1ST SESSION, 39TH CONGRESS. *Buffalo Med. and Surg. Jour.* 6: 390-396.

Gives a table showing the measurements of the height, weight, chest, and head and the date of birth of the Senators of the first session Thirty-ninth Congress of the United States. It was originally published in Sutton's Reporter, Washington, January 14, 1867. A short discussion comparing these figures with those derived from other sources is also included.

BARDEEN, C. R.

[1920]. THE HEIGHT-WEIGHT INDEX OF BUILD IN RELATION TO LINEAR AND VOLUMETRIC PROPORTIONS AND SURFACE-AREA OF THE BODY DURING POSTNATAL DEVELOPMENT. *Carnegie Inst. Wash. Contrib. Embryology* 9 (46): 483-554, illus.

Includes data reported by many investigators and an extensive bibliography.

1923. GENERAL RELATIONS OF SITTING HEIGHT TO STATURE AND OF SITTING HEIGHT AND STATURE TO WEIGHT. *Amer. Jour. Phys. Anthropol.* 6: 355-388.

By a study of statistics reported by a large number of other investigators the author finds certain relationships between the sitting height, stature, and weight.

BEAN, R. B.

1922. THE SITTING HEIGHT. *Amer. Jour. Phys. Anthropol.* 5: 349-390, illus.

Reports measurements taken by the author of the sitting height of white children of Ann Arbor, Mich.; white students and professors of the University of Virginia; white and negro soldiers; engineers; and Filipino children, students, and adults. Also summarizes sitting heights of more than 200,000 persons throughout the world taken by various investigators. Concludes that the sitting-height index varies with race, type, stature, and sex. Some of these data are given in abstracts entitled "The Adult Sitting Height" and "The Sitting Height in Children," *Anat. Rec.* 18: 222. 1920.

BEAN, R. B.

1928. STATURE THROUGHOUT THE WORLD. *Science* (n. s.) 67: 1-5.

In a discussion of the stature of the people in various countries, the author compares the statures of men, women, and children in the tide-water, piedmont, and mountain sections of Virginia, as shown by a study in which he measured several thousand Virginians.

BOAS, F.

1910. CHANGES IN BODILY FORM OF DESCENDANTS OF IMMIGRANTS. U. S. Cong., 61st, 2nd sess., Senate Doc. 208. 113 p., illus. Washington [D. C.], Government Printing Office.

Reports a study of stature, weight, general physiological development of the individual, length and width of head, width of face, and color of hair, eyes, and skin of immigrants and their descendants.

1911. CHANGES IN BODILY FORM OF DESCENDANTS OF IMMIGRANTS. (FINAL REPORT.) U. S. Cong. 61st, 2nd sess., Senate Doc. 208. 573 p., illus. Washington [D. C.], Government Printing Office. (U. S. Immigr. Commr. Rpt. 38.)

A partial report of this same subject by the same author was transmitted to Congress Dec. 16, 1909 (see preceding reference), and ordered reprinted with corrections and illustrations. Data are included on stature, weight, and head measurements of foreign-born Americans of various races and of their American-born and foreign-born descendants.

BOWDITCH, H. P.

1889. THE PHYSIQUE OF WOMEN IN MASSACHUSETTS. *Mass. Bd. Health Ann. Rpt.* 21: [285]-304, illus.

Reports height, weight, sitting height, and stretch of arms of 1,107 women 17 years of age and upward (chiefly below 24 years) living in Massachusetts. These data are compared with the results reported by Sargent (see p. 39) for American women and also with measurements of English women.

DUN, W. A.

1887. THE POLICE STANDARD OF CINCINNATI. WITH SOME STATISTICS COMPILED FROM THE FIRST THOUSAND EXAMINATIONS OF APPLICANTS. *Cincinnati Lancet-Clinic* (n. s. 18) 57: 131-135.

Gives the Cincinnati police, New York City police, and United States Army standard as to height, weight, and chest measure of men accepted.

EMERSON, W. R. P., and MANNY, F. A.

1929. TABLES OF AVERAGE AND OPTIMUM WEIGHT FOR HEIGHT. *Arch. Ped.* 46: 382-390, illus.

Reports a height-weight table for males and females based on clinical tests and studies. A range of optimum weights is given for each height, within which the individual may find that weight which best suits his requirements, taking into consideration age, build, type, etc.

GRAY H., and GRAY, K. M.

1917. NORMAL WEIGHT. *Boston Med. and Surg. Jour.* 177: 894-899.

Gives extensive tables of heights and weights of children and adults based upon observations of the author and other investigators.

— and MAYALL, J. F.

1920. BODY WEIGHT IN TWO HUNDRED AND TWENTY-NINE ADULTS. WHICH STANDARD IS THE BEST? *Arch. Int. Med.* 26: [133]-152, illus.

Reports height, weight, and chest girth of 229 men.

HANSEN, S.

1912. ON THE INCREASE OF STATURE IN CERTAIN EUROPEAN POPULATIONS. Paper communicated to 1st Internatl. Eugenics Cong., London, July, 1912. [Published in *Problems in Eugenics*, p. 23-27.]

Points out the apparent increase in stature of various European populations as shown by the meager data available. Emphasizes the need of anthropometric investigations that will furnish reliable information.

HARRIS, J. A.

1924. ON THE RELATIONSHIP BETWEEN STATURE AND THE LENGTH OF THE APPENDAGES IN MAN. *Amer. Nat.* 58: 254-271, illus.

Statistical study of the relation between stature and sitting height, based chiefly on measurements reported by Boas and Wissler. (See Boas and Wissler, p. 21.)

HRDLÍČKA, A.

1922. ANTHROPOLOGY OF THE OLD AMERICANS. II. STATURE. *Amer. Jour. Phys. Anthropol.* 5: 209-235, illus.

Complete study published later. (See next reference.)

1925. THE OLD AMERICANS. 438 p., illus. Baltimore, Williams & Wilkins Co.

An anthropological study of approximately 900 men and women whose ancestors on both sides were born in the United States for at least two generations. The physical measurements taken included stature, maximum finger reach, height sitting, chest breadth and width, length and breadth of left hand and left foot, maximum girth of left leg, and body weight. Gives tables summarizing data of other investigations.

1926. EFFECTS OF IMMIGRATION ON THE AMERICAN TYPE. *In* Dublin, L. I. *Population Problems in the United States and Canada.* 318 p., illus. Boston and New York, Houghton Mifflin Co.

Compares the body measurements of "Old Americans" (see above) with those of 12 groups of immigrants. Includes data on stature, height sitting, and dimensions of head, face, nose, chest, hands, and feet.

KINNICUTT, W. H.

1895. MEASUREMENTS. *Phys. Ed.* 4: 61, 131, 154, illus.

Gives charts illustrating the physical measurements of a few men of different types.

MACDONALD, A.

1912. STATISTICS OF PHYSICAL MEASUREMENTS AND ANOMALIES OF CRIMINALS. *Alienist and Neurologist* 33: 31-68.

Includes measurements of head circumference, height, circumference of chest, arm reach in relation to height, and other anthropometric data in regard to criminal and insane persons. Some measurements of soldiers are given for comparative purposes.

MULHALL, M. G.

1884. MULHALL'S DICTIONARY OF STATISTICS. 504 p., illus. London and New York, George Routledge & Sons.

Contains data on the height, weight, and chest measurements of men and women of various nationalities. The source of these figures is not given.

1892. THE DICTIONARY OF STATISTICS. 632 p., illus. London, New York [etc.], George Routledge & Sons.

Gives average height and weight of men, women, and children in various countries as reported by different investigators.

PFISTER, F.

1897. ANTHROPOMETRIC CHART, ARRANGED FOR THE USE OF GYMNASIA AND HIGHER SCHOOLS. *Mind and Body* 4: 227.

Gives 26 items of body measurements based on the measurement of 67 men, mostly mechanics, between 18 and 32 years of age. Reviewed briefly in *Phys. Ed.* 4: 155.

QUETELET, [L. A. J.]

1842. A TREATISE ON MAN AND THE DEVELOPMENT OF HIS FACULTIES. (Now first translated into English.) 126 p., illus. Edinburg, William and Robert Chambers.

Includes chapters on physical growth and development. Quotes data from other investigators and reports measurements taken by the author on stature and weight.

ROBERTS, C.

1877. THE PHYSICAL DEVELOPMENT AND THE PROPORTIONS OF THE HUMAN BODY. *St. George's Hosp. Rpts.* 8: [1]-48, illus.

Although most of the data refers to English persons, this paper is an excellent summary of some of the earlier investigations. Of historical interest.

SARGENT, D. A.

1887. THE PHYSICAL PROPORTIONS OF THE TYPICAL MAN. *Scribner's Mag.* 2: 3-17, illus. [Reprinted by Sargent, D. A., and others, in *Athletic Sports*, p. 3-47. [n. p.], Charles Scribner's Sons, 1897.]

Semipopular account of methods used by the author in arousing interest in body development. Contains a very complete list of physical measurements. Charts showing measurements of a few individuals are included.

SARGENT, D. A.

1893. ANTHROPOMETRIC CHART WITH TABLES AND SCALES ARRANGED FOR BOTH SEXES, SHOWING THE DISTRIBUTION OF ANY AMERICAN COMMUNITY AS TO PHYSICAL POWER AND PROPORTIONS, ALSO THE RELATION OF THE INDIVIDUAL IN SIZE, STRENGTH, SYMMETRY, AND DEVELOPMENT TO THE NORMAL STANDARD OF THE SAME AGE. Cambridge, Mass.  
A collection of 22 charts.

SAWYER, M., STONE, R. H., and DU BOIS, E. F.

1916. CLINICAL CALORIMETRY. NINTH PAPER. FURTHER MEASUREMENTS OF THE SURFACE AREA OF ADULTS AND CHILDREN. Arch. Int. Med. 17: [855]-862.

The so-called linear formula for the estimation of the surface area was tested on four new subjects of varying size and shape.

SEAVER, J. W.

1896. SOME NEW ANTHROPOMETRICAL DATA. Yale Med. Jour. 2: 149.

Gives the record of 500 men selected on the basis of perfect health and physical activity, most of whom were athletes. Fifty-one items of physical measurements and strength tests are included.

STOCKARD, C. R.

1923. HUMAN TYPES AND GROWTH REACTIONS. Amer. Jour. Anat. 31: 261-288, illus.

The author contends that all ordinary persons fall more or less exactly into two groups, the linear type and the lateral type. These are discussed in detail. A photograph is included of a statue constructed by Miss Davenport, daughter of C. B. Davenport, on the basis of average physical measurements obtained by the United States War Department of drafted men. (See Ireland, Davenport, and Love, p. 31.) The author points out that this figure has a number of abnormal proportions.

TOPINARD, P

1878. ANTHROPOLOGY. 548 p., illus. London, Chapman & Hall; Philadelphia, J. B. Lippincott & Co. [Translated by R. T. H. Bartley.]

Reviews many of the earlier conceptions of physical proportions; discusses body measurements of different races.

## NEED FOR A SCIENTIFIC BASIS FOR GARMENT AND PATTERN SIZES

The need of improving the present situation in regard to pattern and garment sizes has been stressed in trade and other publications during the last few years. As is emphasized in some of the following articles, no improvement is possible until a scientific study of the body measurements of large groups of people is made with the needs of the consumer definitely in view.

ANONYMOUS.

1919. SHIRT MEASUREMENTS SHOULD BE STANDARDIZED. Clothing Trade Jour. 16: 128.

Stresses the difficulties of the consumer in getting correctly sized shirts. States that the manufacturer has had no guide on widths in cutting his shirts but has made them by rule-of-thumb methods or by ripping up and copying the product of some other manufacturer. Emphasizes the need of correctly sized standardized patterns.

1925. HOW LONG ARE 38'S TO BE ONLY 36'S? Dry Goods Econ. (sec. 1), 79th Yr. (4211): 23-24.

A discussion of garment sizes from the retailer's point of view. Points out the need for size standardization and urges its adoption.

1925. OVERALL MANUFACTURERS ARE ASKED TO HELP IN MEASUREMENT RESEARCH. Daily News Rec. No. 67 (whole no. 9804): 1.

Reports that a recommendation will be submitted to the Federal Specifications Board that a study be undertaken of specifications for measurements of overalls and jumpers.

1925. FINDS NEED OF TOO MANY ALTERATIONS. Daily News Rec. No. 19 (whole no. 9756): 6.

A retailer of boys' clothing complains that too many alterations are necessary on boys' clothing.

## ANONYMOUS.

1925. STORES REPORT LOSS OF SALES DUE TO UNDERSIZING AND LATE DELIVERIES. *Women's Wear* 30 (47): 22.

Two retailers point out the difficulties resulting from undersizing of women's garments.

1925. STOCKHOUSES TO CONSIDER SIZE STANDARDS PLAN. *Women's Wear* 30 (62): 29.

An announcement that the National Garment Retailer's Association proposal that sizes of women's garments should be standardized will be placed before the Merchants' Ladies' Garment Association.

1925. TOO MANY SIZES HELD "MADE BY PENCIL." *Women's Wear* 30 (62): 29.

Quotes a buyer for a retail distributing house in St. Louis, Mo., who states that in his opinion many of the manufacturers are making their sizes with a lead pencil.

1929. STANDARD MEASUREMENTS. *Clothing Trade Jour.* 33: 160, 168.

Discusses the importance of correct sizing of garments and the need of standard measurements. Emphasizes that a study should be made of body measurements upon which sizes for garments could be based.

## ALLISON, A. F.

1929. RELIEF FOR PRESENT MARKETING DIFFICULTIES. U. S. Dept. Com., Bur. Standards Com. Standards Mo. 6: 20-21.

Discusses the evils of "skimp cutting" and the steps that have been taken by some garment manufacturers to establish uniform sizing practices.

## BOROUGH, G. C.

1920. SA[R]TORIAL SCIENCE. ANATOMY IN THE CUTTING ROOM. *Clothing Trade Jour.* 17: 280-281, illus.

Discusses the need of a knowledge of anatomy on the part of garment manufacturers and their neglect of this source of information.

## CAMPBELL, W. H.

1926. FITTING STOUT CUSTOMERS A HARD PROBLEM, SAYS RETAIL SPECIALIST. *Nugent's Garment Weekly* 74 (2): 26, 29, 58, illus.

Protest against the skimpy measurements of dresses for stout women. Maintains that not one stout woman out of two hundred can be fitted without alterations. Emphasizes the need of knowing the average measurements of such women.

## COHEN, I.

1916. STANDARDIZATION OF PATTERNS. *Clothing Designer and Manfr.* 9 (2): 25, illus.

Reports an effort of the National Association of Garment Manufacturers to standardize patterns for overalls.

## FITZGERALD, W. A.

1929. WHY ALL THIS EXPENSE IN FITTING THE CUSTOMER? LARGE PERCENTAGE OF DRESSES SELLING AT \$35 OR MORE REQUIRE ALTERATION. *Dry Goods Econ.* (sec. 1), 83d Yr. (4427): 22-23, 25.

A summary of replies to a questionnaire on causes of alterations and their cost to customers from 44 stores located in various parts of the country. Only garments retailing at \$35 or more were considered. The percentage of dresses upon which alterations were made, the average charge per customer, and the percentage of dresses improperly sized are some of the data reported. A standard system of sizing, correctly sized patterns, and checking of sizes by the retailer are among the suggestions for improving the situation.

## KNAPP, J. W.

1925. STANDARD MEASUREMENT PROBLEM ANALYZED AND REMEDIES SUGGESTED IN REPORT. *Women's Wear* 30 (152): 30, 32; 31 (1): 18, 33; (2): 27, 39; (3): 13.

A retailer discusses the present difficulties due to lack of size standardization of ready-to-wear garments and suggests ways of remedying the situation. The paper was given before the convention of the Michigan Retail Dry Goods Association.



NYSTROM P. H.

[1928]. ECONOMICS OF FASHION. 521 p., illus. New York, The Ronald Press Co.

Contains a chapter on the standardization of sizes and types in apparel in which the lack of authentic information on this subject is stressed. Tables from various investigators are quoted and a bibliography is included. Size specifications prepared from schedules actually in use in garment manufacturing and retail concerns are given in an appendix to the volume.

O'BRIEN, R.

1929. NEED FOR GARMENT SIZE STANDARDS. U. S. Dept. Com., Bur. Standards Com. Standards Mo. 6: 168-169.

Discusses the need of size standardization of ready-to-wear garments and the historical development of the sizes now in use. Urges that a study of body measurements of Americans be made in order that garment sizes may be based on actual measurements.

— and CAMPBELL, M.

1927. PRESENT TRENDS IN HOME SEWING. U. S. Dept. Agr. Misc. Pub. 4, 15 p.

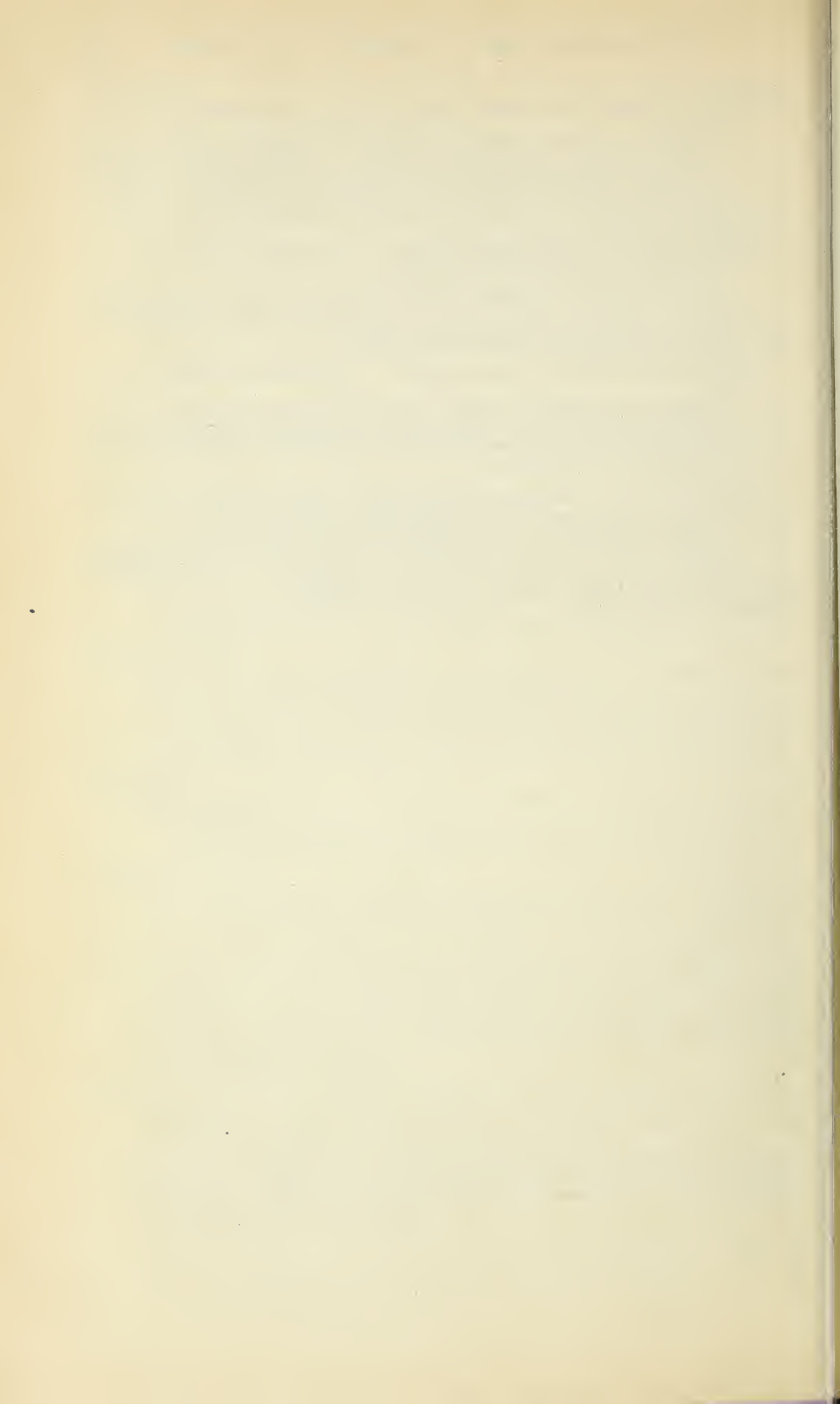
Reports the results of a survey of the amount and kind of home sewing being done by rural and urban women in families of various incomes, the difficulties they encounter, and their reasons for making garments or buying them ready-made.

SAUM, G. E. F.

1925. STANDARDS IN CLOTHING MANUFACTURE. MAKING GARMENTS THAT FIT WITHOUT ALTERATIONS. *Mangt. and Admin.* 9: 59-61, illus.

General discussion of the value and need of size standardization. Reports data on waist, chest, and hip measurement of 2,139 women students taken by the physical training department of Pratt Institute. Methods of taking the measurements are not given.

WISSLER, C. (See p. 33.)



## AUTHOR INDEX

	Page		Page
Affleck, G. B.	19	Fuld, L. F.	14
Allen, J. A.	33	Gershel, M. A.	23
Allen, N.	35	Gihon, A. L.	31
Allison, A. F.	44	Gilbert, J. A.	23
Amherst College	35	Gittings, I. E.	36
Anderson, W. G.	18, 35	Godin, P.	23
Association of Life Insurance Medical Directors and the Actuarial Society of America	33	Gould, B. A.	31
Baldwin, B. T.	19, 20	Gower, C.	23
Bardeen, C. R.	40	Gray, H.	14, 15, 23, 24, 36, 41
Barr, A. L.	35	Gray, K. M.	23, 41
Baxter, J. H.	29	Greenleaf, C. R.	31
Bean, R. B.	35, 40, 41	Greenwood, J. M.	24
Bemies, C. O.	35	Griffith, J. P. C.	24
Benedict, F. G.	20	Grover, J. I.	24
Bernard, M.	7	Gullick, L.	15, 18
Beyer, H. G.	30	Hall, W. S.	15, 24
Boas, F.	11, 20, 21, 41	Hanna, D.	18, 36
Boring, E. G.	33	Hansen, S.	41
Boroughs, G. C.	44	Hanson, G. F.	13
Bowditch, H. P.	21, 41	Happle-Hutcheson, J.	8
Boyd, E.	11	Harris, J. A.	41
Bradfield, H. S.	11	Hartley, J. S.	4
Brinton, D. G.	12	Hartwell, E. M.	15
Browne, C. R.	12	Hastings, W. W.	15, 24
Burk, F.	21	Hay, D. R.	4, 5
Cambridge Scientific Instrument Co.	12	Herskovits, M. J.	24
Campbell, M.	45	Hitchcock, E.	15, 18, 36, 37
Campbell, W. H.	44	Hoffman, F. L.	31
Carlstrom, J. A.	7	Hogarth, W.	5
Chapin, H. D.	21	Holgate, T. H.	16
Christopher, W. S.	21	Holmes, B.	24
Clapp, A. B.	18	Holmes, W. H.	16
Clark, T.	21, 22	Holt, L. E.	24
Clark, W.	21	Howland, J.	16, 24
Cleland, J.	12	Hrdlička, A.	16, 25, 42
Clough, H. D.	12	Illinois Department of Public Health	25
Cohen, I.	44	Iowa Child Welfare Research Station, State University of Iowa	25
Collings, P. E.	27	Ireland, M. W.	31
Collins, G. L.	21	Jackson, C. M.	38
Collins, S. D.	22	Jackson, W. A., jr.	16
Cook, R. J.	35	Jacomb, W. L.	24
Coolidge, R. H.	30	Johnson, M. M.	38
Cordeiro, F. J. B.	12	Kean, A.	8
Crampton, C. W.	22	Kilbourne, H. S.	31
Crawford, C.	26	Kinnicut, W. H.	42
Crum, F. S.	22	Kirkpatrick, E. A.	25
Cunningham, D. J.	12	Knapp, J. W.	44
Dana, R. T.	16	Laws, E. A.	8
Davenport, C. B.	13, 31	Lees, H. D.	38
Dawson, G. E.	22	Liharzik, F. P.	5
DeBusk, B. W.	22	Little, B. B.	39
Dickson, S. H.	36	Love, A. G.	31
Downes, R. M.	13	MacCurdy, G. G.	17
Draper, G.	13	McCurdy, J. H.	17
Dreyer, G.	13	MacDonald, A.	17, 23, 31, 42
Dublin, L. I.	23, 33	Manny, F. A.	41
Du Bois, D.	13, 14	Manchester, H. H.	5, 31
Du Bois, E. F.	13, 14, 43	Marshall, J.	5
Duckworth, W. L. H.	14	Mayall, J. F.	41
Dun, W. A.	41	Meylan, G. L.	17, 38
Dwight, T.	14	Miles, W. R.	38
Elliott, E. B.	30	Mitchell, A. G.	24
Elsom, J. C.	36	Moon, S. B.	26
Emerson, W. R. P.	41	Moore, T. S.	5
Erbeske, C. J.	36	Mosher, C. D.	33, 39
Erb, F. H.	7, 8	Moss, R. E.	33
Faber, H. K.	23	Mulhall, M. G.	42
Fallie, R.	14	Murlin, J. R.	12
Fitzgerald, W. A.	44	Musselman, F.	26
Fletcher, R.	4	Mustard, H. S.	26
Foster, A. B.	36	Myers, B.	26
Fraleigh, F.	23	Narragansett Machine Co.	17
Frankel, L. K.	23	Newcomer, M.	39
Frassetto, F.	14	Nicholson, S. T.	24
Freeman, R. G.	23	Nystrom, P. H.	45
Fry, J. B.	30	[Oakland, Calif.] Board of Education	26

	Page		Page
O'Brien, R.....	45	Stanley, W. F.....	18
Old Hand.....	8	Stephenson, W.....	27
Palmer, G. L.....	39	Stiles, C. W.....	28
Parmenter, D. C.....	36	Stockard, C. R.....	43
Pasmore, E. E.....	39	Stockton-Hough, J.....	28
Peckham, G. W.....	26, 39	Stone, C. J.....	10, 11
Pfeiffer, M. W.....	40	Stone, R. H.....	43
Pfister, F.....	42	Story, W. W.....	6
Phillips, P. C.....	39	Sullivan, L. R.....	18
Porter, W. T.....	25, 27	[Suter, J.].....	11
Proud, A. H.....	8	Swain, F.....	19
Prudential Insurance Co. of America. Ordinary department.....	34	Sydenstricker, E.....	22
Pyle, W. H.....	17, 27	Talbot, F. B.....	20, 28
Quetelet, [L. A. J.].....	42	Tarbell, G. G.....	28
Rawlings, L. B.....	17	Taylor, C. K.....	28
[Regal, S.].....	8	Taylor, R.....	28
Richards, A.....	39	Todd, T. W.....	19
Roberts, C.....	17, 42	Topinard, P.....	19, 43
Robertson, T. B.....	27	Treadway, W. L.....	21
Root, H. F.....	17	Tuckerman, F.....	40
Rosenfeld, I.....	8	United States Department of Labor. Children's Bureau.....	28, 29
Rowe, A. W.....	18	United States Navy Department. Surgeon General's Office.....	32
Rude, A. E.....	27	[United States] Office of the Provost Marshal General.....	32
Ryan, D. E.....	9	[United States War Department].....	32
S., T. B.....	34	[United States] War Department. Surgeon General's Office.....	32
Sargent, D. A.....	5, 18, 39, 42, 43	Walker, A. M.....	15
Saum, G. E. F.....	45	Waring, J. I.....	26
Sawyer, M.....	43	Washington, M.....	19
Scammon, R. E.....	11	Weisman, S. A.....	40
Schadow, G.....	5	Weisse, F. S.....	34
Searfoss, R.....	23	West, G. M.....	29
Seaver, J. W.....	18, 43	Weymouth, F. W.....	39
Seelye, H. H.....	15	Wheeler, G. A.....	28
Shepherd, G. R.....	34	Whipple, G. M.....	19
Silsby, D. H.....	27	Wilder, H. H.....	19, 40
Simons, H.....	9, 10	Wissler, C.....	21, 33
Simons, S.....	10	Wood, M. A.....	18
Simpson, J. B. (Inc.).....	10	Woodbury, R. M.....	29
Skerrett, R. G.....	18		
Smedley, F. W.....	27		
Smith, R.....	10		
Stalnaker, E. M.....	27		

